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Lowell Fights Undernourishment

McNAMARA

Military Preventive Medicine

DUNHAM

Filtered Sewage Discharge

EDDY

Ice Cream

NUTRITIVE VALUE—PALMER
SANITARY CONTROL—FABIAN

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Training in Military Preventive Medicine*

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THE prevention of disease and the promotion of health among its personnel is one of the most important activities of a war-time army. The day is past when an army can be mobilized, trained and successfully employed in combat unless every possible measure is taken to protect the health of the troops. The army consists of men drawn from all walks of life and from all types of environment. During and after mobilization, each individual is subjected to environmental conditions which, unless controlled, will entail a high degree of exposure to infectious disease.

The prevention of disease and the promotion of health in a military force are no longer considered on humanitarian grounds only, nor ignored when rendered inconvenient by purely military activities. Preventive medicine enters so intimately into all training and operation that it has become an essential military factor which must be provided for in all plans. No American army in the future can reasonably hope to defeat the forces of a first class enemy power if the troops are not given adequate protection against disease.

The health of a force can be protected and maintained only when the plans are formulated and carried out by officers trained in health work. It follows that in the event of an emergency which would compel the United States to engage in a major war, the control of disease among the troops must be accomplished mainly by men who are now working in the field of preventive medicine in civil life as physicians, engineers, technicians, research workers, and such. The

sanitarians of the Regular Army are few and could not possibly cope with the work that would be made necessary by mobilization. The National Defense Act provides for this contingency by authorizing during peace the organization and training of an Officers Reserve Corps.

The Medical Department Reserve has approximately 20,000 officers, organized into 5 sections: Medical, Dental, Veterinary, Sanitary and Administrative. The Medical, Dental and Veterinary Sections are composed of doctors of medicine, dentistry and veterinary medicine, respectively. The Sanitary Section consists largely of sanitary engineers, and experts in bacteriology, nutrition and metabolism, chemistry, and so on, with specialists in certain other lines not concerned with health.

The Medical Department is responsible to higher military authority for the initiation and supervision of all disease control and health promoting measures. Early in the World War it became apparent that officers trained in medicine alone were not equipped to solve many of the health problems requiring an expert knowledge of one of the allied sciences; consequently, steps were taken to commission in the Medical Department those having the required training. This group, with those commissioned since the World War, now constitutes the Sanitary Section of the Officers Reserve Corps.

The Medical Department officers who will supervise the health work and train others during any future war will be drawn largely from those in the Medical and Sanitary Sections of the Reserve who have had experience in preventive medicine. These officers will have received their basic training in medicine in the performance of their professional work in civil life. They must, however, receive a certain amount of training in military preventive medicine before they can function efficiently with a military force. This can be obtained either by organized training during peace or by the trial and error method after war is declared.

Military preventive medicine differs from that in civil communities in its administrative features, and to some extent in the means employed in the application of accepted procedures. It must be remembered that the primary mission of the army is to defeat the enemy and that all other functions and activities are subordinated to the accomplishment of that mission. A military force is a machine, each part of which must operate in coördination with all other parts. This does not mean that disease control measures can be neglected or ignored, as they are of vital importance to the success of training and combat operations. They must however be so adapted to existing

conditions as to afford the required protection with the least practicable interference with other activities. Military preventive medicine differs from that practiced in civil communities to an extent which renders it necessary for reserve officers, who are experts in their fields in civil life, to acquire additional training in order to apply successfully their knowledge to military conditions.

In the practice of military preventive medicine, measures must be adapted to, or modified to conform with, the restrictions and limitations imposed by a constantly changing situation. While military factors may at times prevent the adoption of a more desirable though more elaborate procedure, the administrative control of health is far more complete in a military, than in the average civilian, community. The extent of this control is such that the resulting protection in an army is, in general, much more effective than that in a civilian community, provided the officers in charge are conversant with the military phases of preventive medicine.

It is obvious that all reserve officers should receive basic military training in time of peace in order that they may be prepared to train other officers and enlisted men in the event of war. Under the provisions of the National Defense Act, such training is provided, including the organization and functions of military units and the strictly military features of the various services. While this is basically essential for those officers who are to be assigned to health work in the army, it does not prepare them for their special duties since it does not show them how their knowledge can be applied under military conditions.

Reserve officers, who are specialists in preventive medicine, will in most instances be assigned in war to duties connected with disease control and health promotion in the army. They should therefore receive training during peace-time in the military phases of their wartime duties. Basic military training, as described above, does not meet this need, and so special courses of instruction must be given.

Instruction of this character can be given in two ways under the schemes now authorized by the federal government. Selected reserve officers may be detailed to attend a summer training camp or they may be given correspondence courses. The summer training camp has the disadvantage of short duration—usually 2 weeks—and of occurring at a time when not all reserve officers can leave their normal vocations. It has the great advantage of bringing officers into personal contact with one another and with their instructors, and of making the training much more practical. Correspondence courses may be made quite extensive and inclusive in subjects which can be

taught by correspondence. They may also be undertaken when, and as rapidly as, the student has the available time. A disadvantage is the difficulty of imparting adequate instruction in certain subjects of a more practical nature.

Prior to 1928, no definite instruction in military preventive medicine had been offered to reserve officers, but for several years there had been an increasing demand for such a course. This was due partly to the progress in disease prevention, and partly to the growing realization of the important rôle which disease control will play in the next war. To provide a means for giving this instruction, an annual 2 weeks' summer camp course was established at the Medical Field Service School, Carlisle Barracks, Pa., from July 8 to July 21, 1928. This is known as the "Special Course—Military Sanitation," the term "Military Sanitation" being used to denote all phases of military preventive medicine.

Attendance is voluntary, selected officers who indicate the desire being ordered to active duty for training purposes. The 1928 class consisted of 46 reserve officers, members of the Sanitary and Medical Sections of the Medical Department Reserve. These officers, with a few exceptions, are in civil life engaged in work concerned, directly or indirectly, with the prevention of disease, and all would be assigned to disease control work if called to active duty. Some are sanitary engineers, others health officers of civil communities, specialists, research workers or teachers in such sciences as bacteriology, nutrition and chemistry. A number of them are widely known authorities in their particular fields.

The instruction given during the course is intensive and designed to emphasize the military aspects of preventive medicine. It consists mostly of practical demonstrations showing how the usual disease control procedures would be executed in given military situations. Didactic instruction is reduced to a minimum and discussions of technical procedures are limited to orientation and preparation for practical demonstrations. Methods of conducting sanitary surveys are demonstrated and instruction is given in the preparation and enforcement of the sanitary order (the sanitary code of a military community). Throughout, stress is placed on the administrative features of disease control and the practical methods of coördinating this work with other military activities. Much attention is devoted to the means by which coöperation between the Medical Department and other branches, both staff and line, is maintained for the purpose of protecting and promoting the health of the troops.

The application of disease control procedures in selected military

situations is considered for mobilization and training camps, concentration areas and camps, and the combat zone. Terrain exercises, in which the situation being depicted is simulated in the field, are utilized.

As the 1928 camp course was the first organized course of instruction in military preventive medicine given to reserve officers since the World War, it was in a way an experiment conducted to determine two important factors: (1) whether the reserve officers concerned desired this kind of training; and (2) if teaching the military phases of preventive medicine by a 2 weeks' summer training camp course is a practical procedure.

The type and number of reserve officers who took the course justifies the conclusion that training of this nature is desired by those interested in preventive medicine. This is an important factor as no scheme for the military training of the Reserve components of an army can be successful in peace if it is not supported by public opinion as expressed by the members of the group who are to be trained.

The experience gained definitely indicates that it is a practical method of teaching the military features of military preventive medicine, and that it will give results which are of great value to those taking the course. It offers what is apparently the best method at present of instructing reserve officers, and should prove a valuable contribution to military preparedness.

Juvenile Court Statistics in Belgium

THE number of cases handled by the juvenile courts of Belgium decreased from nearly 17,000 in 1913 to 11,000 in 1927, according to statistics published by Dr. Isidore Maus, Director General of the Belgian Child Welfare Office. This decrease has been particularly great and constant since 1920, and is attributed by Dr. Maus partly to the improvement of the economic situation of the working classes and the decrease in the birth rate during the war, and partly to the effect of the child welfare law of 1912, which provides for probation and other preventive and corrective measures.

The number of cases put on probation has shown a tendency to increase in the last few years. There has also been a considerable increase in the number of cases committed to specialized institutions. The number of cases referred to societies or institutions interested in general care of children has continued to decrease greatly.

The jurisdiction of the juvenile court ends at the age of 21. A follow-up study of nearly 10,000 former juvenile delinquents showed that between the ages of 21 and 26, 82 per cent had no conflict with the law.—*L'Application de la loi du 15 Mai 1912 sur la Protection de l'Enfance de 1913 à 1927*, Brussels, 1928, 27 pp.

The Sanitary Control of Ice Cream*

F. W. FABIAN

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ICE CREAM is no longer considered a confection or luxury, but a food. Since it contains on the average approximately 22 per cent milk solids, it is a dairy product. It has won a high place in the American diet and is recommended by leading dietary authorities as an attractive way of serving milk to the family.

There is reason to believe that it was known in Europe as early as the 13th century and certainly in the 16th, though it did not assume the position it rightfully merits until recently. The ice cream industry as we know it today is a development of the last 25 years, during which time it has reached tremendous proportions, especially in the United States. This is due to several factors, the most important of which are its food value, modern machinery, and modern methods of merchandising.

It was estimated that the production of ice cream in 1927 in the United States was 335,703,610 gallons, a per capita consumption of 2.85 gallons. In 1910 the estimated production was 95,450,000 gallons. The capital invested in 1926 was estimated to be over $450,000,000.

METHODS OF SANITARY CONTROL

Milk, cream, condensed and evaporated milk, milk powder and butter are used in the manufacture of ice cream, and contribute by far the greater number of bacteria to it. Other constituents, such as gelatin, sugar and flavoring extracts, are used in such small quantities, or contain so few bacteria, that they may be left out of consideration. The fundamental problems of ice cream and milk control are the same.

To produce wholesome ice cream we must start with clean, raw products properly pasteurized and processed in clean machinery operated by sanitary workers. The requirements for milk for ice cream should be the same as those for market milk. The same sanitary safeguards should surround all dairy products whether they enter the ice cream mix or are used in some other way.

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* Read before the Food, Drugs, and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

PASTEURIZATION

More interest is being shown in this phase of ice cream control than in the past. In 1926 a committee of this Association recommended legislation requiring nation-wide pasteurization of the ice cream mix. The manufacturers themselves are in favor of such action, as expressed by the Secretary of their association:

> Pasteurization of ice cream mixes should be made universally compulsive and it is interesting to see that so many states this year took action on this subject. The National Association is on record favoring pasteurization of the ice cream mix. It would seem desirable for state associations to encourage the passage of pasteurization laws in their respective states.

Activity has been manifested during the past three years in this direction. According to the latest information available 2 states and 1 province require the ice cream mix to be pasteurized; 11 states and the District of Columbia require the milk and cream used in the mix to be pasteurized. Some of the states require that all milk be obtained from tuberculin tested cows; prohibit the handling of ice cream by those having an infectious disease; and require a health certificate for those employed in making ice cream. These are necessary safeguards and should be included in any law governing the manufacture of ice cream.

As in the case of milk, the time and temperature requirements for pasteurizing the mix for the different states are variable, ranging from 140° F. for 25 minutes to 185° F. flash. This is unfortunate. After studying the results secured by one commercial plant over a period of years Fabian recommended a temperature of 150° F. for 30 minutes. Due to the nature of the product this higher temperature is necessary to insure proper results. The product is injured in no way physically.

Some laws require that only the milk and cream used in the manufacture of ice cream be pasteurized. It is much more satisfactory to require pasteurization of the whole mix, since it gives more uniform results and is in accord with the best practice of the industry.

TOOLS OF THE HEALTH OFFICER

In controlling the sanitary quality of ice cream the health officer has two effective tools—bacteriological analysis of the finished product, and sanitary inspection of the plants. It is recognized that while mere numbers of bacteria may not be significant from a sanitary standpoint, in the case of dairy products an excessive number is generally associated with carelessness. With proper care it is possible to produce ice cream with a bacterial count of around 100,000 per gram. A count greatly in excess of this may be due to any one or all of the

following: poor quality of ingredients, inefficient pasteurization, improper ageing, deficient cleansing of equipment, and carelessness of the employees.

Data have been assembled showing that it is possible and desirable to produce ice cream having a bacterial count of 100,000 or less per gram. Fabian has suggested a bacteriological standard of 100,000, based on 1,110 samples from 36 plants in 5 cities in Michigan.

Only one state has a bacteriological standard for ice cream. In 1927, California passed a law which states, "Ice cream, when sold by the manufacturer, shall not contain in excess of 150,000 bacteria per gram." Several cities have adopted bacteriological standards. Louisville, Ky., has a standard of 800,000 bacteria per c.c.; Harrisburg, Pa., 200,000 bacteria per c.c.; Concord, N. H., has a standard designating grade A ice cream, containing not more that 100,000, and grade B, containing not more than 1,000,000. Boston, Mass., limits the number of bacteria to 500,000 per c.c. Baltimore, Md., allows 200,000 at present, but its ultimate goal is 100,000. While Detroit, Mich., has no legal standard, its aim is to keep the bacteria below 100,000. Chicago, Ill., has a maximum of 500,000 bacteria per c.c. for pasteurized mixes, and no definite standard for the finished product, but requires that it shall not contain an excessive number.

I would suggest to those enacting laws or ordinances that "bacteria per gram" be used instead of "bacteria per cubic centimeter," since I believe that bacteriological determinations of ice cream made on the gravimetric instead of the volumetric basis will be more uniformly satisfactory. The gravimetric basis is used entirely for chemical determinations in ice cream and should be for bacteriological determinations. The volumetric method was inherited from milk analysis and is hard to get rid of.

Some progress has been made in standardizing the methods for analyzing ice cream. The committee appointed by the American Dairy Science Association has published a preliminary report,* and in 1927 the committee appointed by The National Association of Ice Cream Manufacturers made its first report, the two being in essential agreement. We now have outlined definite methods of procedure, among which are: the plate, direct microscopic, the methylen-blue test, and the anerobic spore test, recently proposed by Weinzirl and Harris. There has been some work on the colon group test. However, I do not believe that it has been sufficient to warrant any definite conclusions at this time.

* Copies of this report may be obtained from R. S. Breed, Ph.D., Geneva Experiment Station, Geneva, N. Y. Price, 25 cents.

A potent agency in the sanitary control of ice cream is periodic inspection. This has been found of benefit in other industries and has produced good results in the ice cream industry when consistently practiced. A great aid in the inspection of ice cream plants is the score card. The one with which I am more familiar is being used with success in several large cities. Periodic inspection plus regular bacteriological analyses will do much to keep a close check on the sanitary quality of the product.

WHY ARE SANITARY REGULATIONS NECESSARY?

Owing to a mistaken belief in the germicidal effect of cold, it was thought for a long time that bacteria present in ice cream would be killed by freezing and the subsequent process of hardening in which a temperature as low as — 21° C. was reached. Experiments have demonstrated that many of the pathogens are viable after being exposed to liquid air (— 182° to — 190° C.) for 7 days, and liquid hydrogen (— 252° C.) for 10 hours. It is well known that typhoid bacilli may remain alive in ice for a considerable time. Experiments have shown that they may remain alive in ice cream for 2 years and 4 months, when kept at an average temperature of — 4° F. Other work has demonstrated that hemolytic streptococci and the diphtheria bacillus may remain viable for considerable periods of time in ice cream.

Another line of evidence even more convincing is the numerous epidemics that have been definitely traced to ice cream. Fabian compiled a list of outbreaks attributed to ice cream, and since then reports of many more have been found, which will be published later. Epidemics of typhoid fever, septic sore throat, diphtheria, scarlet fever, dysentery and intestinal disturbances have been reported.

It is interesting to trace the history of ice cream epidemics. They can be grouped roughly according to the period in which they occurred. The first, extending from about 1848 to 1886, may be called the metallic poisoning period, since at this time they were attributed by most workers to poisoning from metals as tin, arsenic and zinc, while others were inclined to lay the blame on the vanilla extract used. The second may be desgnated the ptomaine poisoning era. In 1886 Vaughan discovered and isolated tyrotoxicon. Thereafter, for about 10 years, unless otherwise demonstrated, all ice cream poisoning was attributed to ptomaines. In the third period bacteria came into their own, and most of the epidemics have been definitely traced to a specific organism.

Today with the greatly improved machinery, and with our present

knowledge of sanitation and the application of science to these problems, there seems little excuse for an insanitary or unwholesome product. The ice cream manufacturers as a whole are far more alive to the best interests of their industry than any other group with which I am familiar. They kept abreast of the times and installed expensive pasteurizing and refrigerating equipment in their plants while many health officers were still slumbering. They did not wait for laws or ordinances requiring such action, but while the health officer was fearful about recommending such measures, they were obeying a more urgent law—the economic law. Experience had taught them that a sanitary product was their best business asset. One epidemic directly traced to a plant would tear down more than years of advertising could build up.

One of the finest tributes that can be paid to their good judgment is that, although more ice cream was manufactured in 1927 than ever before in the history of the industry, not one single epidemic was traced to it.

Italian Traveling Tuberculosis Dispensaries

TRAVELING tuberculosis clinics have been recently established in some provinces of Italy for the purpose of carrying medical aid to outlying districts.

Each traveling clinic consists of a large automobile containing equipment to aid in diagnosis of cases of tuberculosis, including a microscope and X-ray apparatus. A physician with two or more assistants is in charge of each.

Upon arrival in a district, the staff of the clinic examines the school children and advises the local authorities with regard to methods of dealing with those who have tuberculosis, such as providing financial aid and hospital and sanatorium treatment. Detailed records are made of each case.

Adults who are known to have tuberculosis, but who are not under medical care, are also examined at the traveling clinic, and provision for their treatment is made. The work of the traveling clinic in each district is concluded with a public lecture on tuberculosis given by its staff.

Recently the National Bureau of Public Health, in a circular addressed to local authorities, has recommended the introduction of such traveling clinics in the small towns and rural localities throughout the country.—*Difesa Sociale*, Rome, Sept., 1928, p. 11.

Nutritive Value of Ice Cream

L. S. PALMER, PH. D.

Professor of Agricultural Biochemistry, University of Minnesota, St. Paul, Minn.

ON theoretical grounds there is abundant evidence to support the belief that ice cream has a high food value. Food authorities and public health officials everywhere have recognized the importance of ice cream as a food, and there have been several more or less practical demonstrations of this fact with public school children. From a more strictly scientific standpoint Smith [1] has shown that ice cream contains the fat soluble A and water soluble B vitamins. However, no one has published data demonstrating under experimental conditions in what manner ice cream supplements a more or less natural diet of the bread, meat, potato and cereal type, during growth. Likewise, it is not known what kind of growth would result if the diet were limited exclusively to ice cream.

The experiment described in this report was for the purpose of answering these questions. It was conducted in the animal nutrition laboratory of the National Dairy Council, at Forest Lake, Minn. The animals used were albino and piebald rats bred in the laboratory. The ice cream used was standard commercial vanilla ice cream purchased in the local market, and was *not* manufactured especially for the experiment. The product used had a standard composition of 38 per cent total solids and 12 per cent fat.

Three types of diets were employed: (1) a basal diet containing no ice cream, (2) the same diet mixed daily with 33⅓ per cent by weight of fresh ice cream, (3) fresh ice cream alone without any other food. Fresh tap water was supplied daily, *ad libitum*, in syphon fountains attached to the outside of the cages. The all ice cream and the one-third ice cream diets were allowed *ad libitum*. The no ice cream basal diet was moistened with water to the moisture content of the one-third ice cream diet. The amount allowed was limited to that consumed by the group receiving one-third ice cream, this being determined each day. The ingredients of these diets are shown in Table I, and the approximate analyses in Table II. The basal diet was designed so that the supplementary effect of the vitamins in the ice cream would particularly be manifested.

The animals were housed in groups in suitable cages having metal

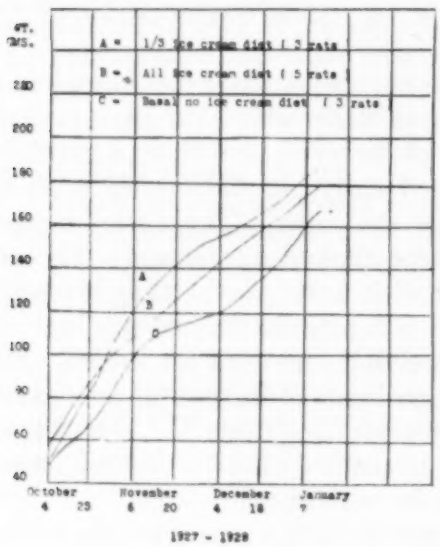
TABLE I

INGREDIENTS OF BASAL AND ONE-THIRD ICE CREAM DIETS AS FED

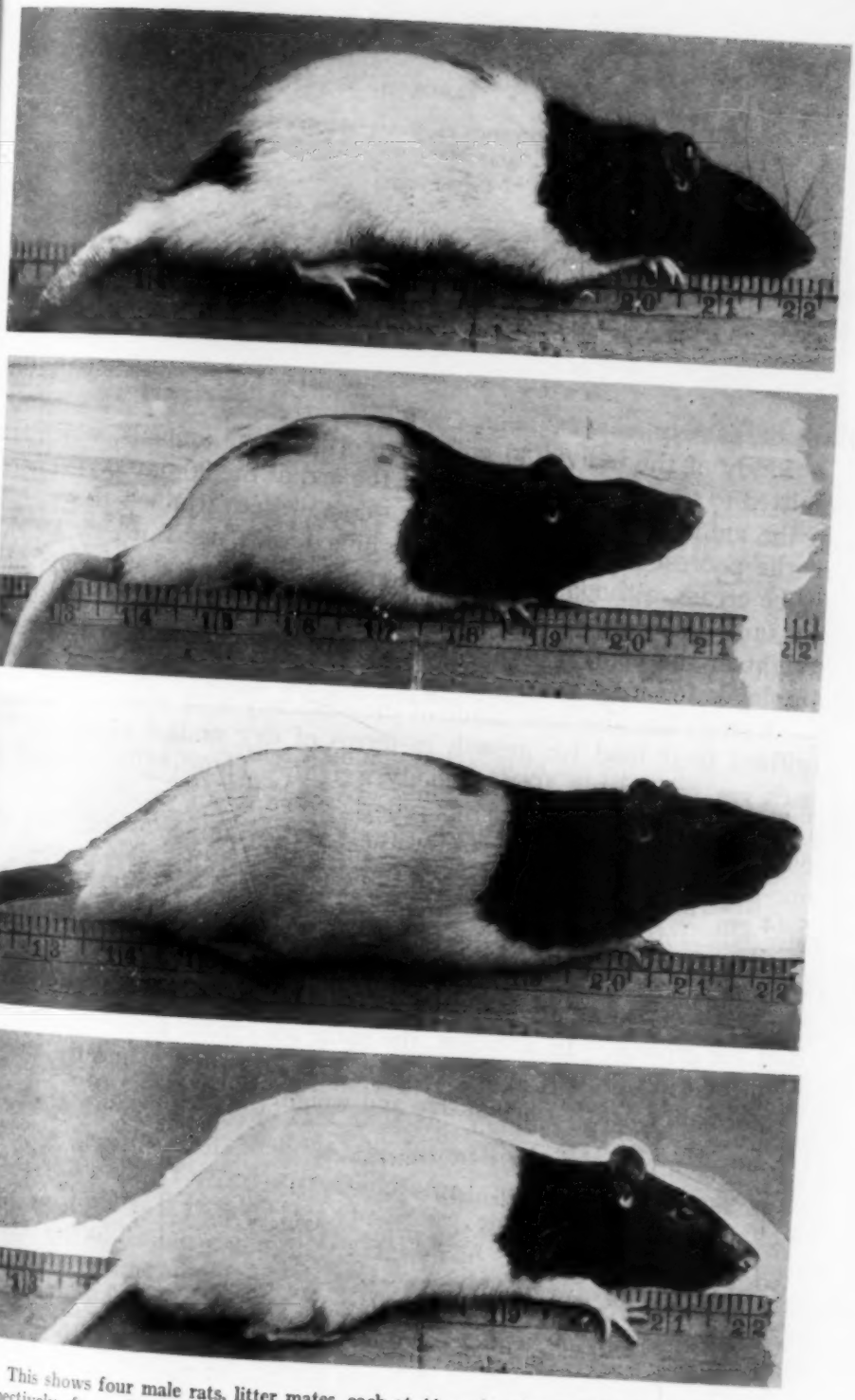
Ingredient	Basal Diet Per Cent	One-third Ice Cream Diet Per Cent
Ice cream	0	33.33
Added water	12.50	0
Dry bread	26.25	20.0
Potato flour	17.50	13.33
White corn	13.13	10.00
Extracted casein	7.87	6.00
Lard	7.00	5.33
Dry cooked beef	4.37	3.35
Oatmeal	4.38	3.35
Sugar	3.50	2.65
Bone meal	2.63	2.00
Salt	0.87	0.66
Total	100.00	100.00

floors covered with shavings. These were cleaned once each week and fresh bedding provided. Food consumption was recorded. The basal and one-third ice cream groups consisted of 3 rats each, and the all ice cream group of 5 rats. Bi-weekly weights of all animals were recorded for the first 90 days, the animals being placed on the diets at weaning, when they were 3 to 4 weeks of age. Males only were used. One group of litter mates distributed among the three experimental groups, and one other of the same litter on the breeding diet, on which similar records were kept, were continued on the diets until 44 weeks of age. These animals are shown in the accompanying photographs.

FIGURE I



The average growth curves of the animals in the several groups for the first 90 days of the experiment are shown in Figure I. The rate of growth of all these animals was considerably slower than that of animals fed the breeding diet; but by the end of 10 months the one-third ice cream group had reached the same weight as the breeding animals, namely, 375 to 400 gm. The animals fed ice cream alone were still gaining at that time and eventually attained the full mature weight for this strain of rats. The animals fed the basal diet



This shows four male rats, litter mates, each at 44 weeks of age, which had been fed respectively, from the time of weaning, on (a) the breeding diet, (b) the basal no ice cream diet described in Table I, (c) the one-third ice cream diet described in Table I, (d) standard commercial vanilla ice cream as the sole diet. The method of feeding diets (b) and (c) is stated in the accompanying article. Rat (a) weighed 375 gm., Rat (b) 205 gm., Rat (c) 400 gm., Rat (d) 300 gm., at the time the photographs were taken.

TABLE II

APPROXIMATE COMPOSITION OF BASAL AND ICE CREAM DIETS
(DRY MATTER BASIS)

	Protein Per Cent	Carbohydrate Per Cent	Fat Per Cent	Nutritive Ratio*
Basal	21.25	59.3	14.2	1 : 4.29
One-third ice cream	19.94	59.8	16.4	1 : 4.82
All ice cream	10.25	58.2	31.6	1 : 12.60

* Ratio between the energy supplied as protein and the total energy of the diet.

without ice cream ceased gaining when they attained one-half this weight, namely, about 200 gm.

Study of the individual growth records of the animals, which are omitted to save space, shows that at the end of the 90-day period none of the animals fed the basal, no ice cream diet, attained the weight of the poorest animal fed this diet mixed with one-third by weight of ice cream, although the mean consumption of total nutrients was the same. Likewise, only 1 animal in the basal group attained the weight of the poorest animal fed ice cream alone, each of the other 4 animals fed ice cream as the sole diet exceeding it by 15 to 30 gm.

A study has also been made of the efficiency with which the groups utilized their food for growth in terms of dry matter consumed for each gm. gained per 100 gm. body weight. The details are omitted for the sake of condensing this report. The mean values for the 90-day period were as follows: for the basal group, 8.74 gm.; for the one-third ice cream group, 6.04 gm.; for the all ice cream group, 5.44 gm.

The results of the experiment are believed to offer important evidence regarding the nutritive value of ice cream. The standard vanilla ice cream used was a valuable supplement to certain types of diet for growth. In addition, the same ice cream alone was capable of promoting growth at a moderate rate to produce mature animals of normal or nearly normal size and weight.

REFERENCE

1. Smith, A. H. *J. A. M. A.*, 79: 2221, 1922.

FIGURE I—Main Building, Lowell Summer Camp

Lowell Fights Undernourishment Among Its School Children*

JOHN J. McNAMARA, M. D.

Director of School Hygiene, Lowell, Mass.

LOWELL, Mass., with a school population of approximately 23,000, found itself compelled in the summer of 1928 to enter the good health market on a large scale. Its immediate purpose was the upbuilding of malnourished and underweight school children; its objective was the purchase of good health insurance for its future citizens.

An outdoor camp for 140 boys and girls and a health center with daily accommodation for 125 children were established. The money and effort expended were justified by the results.

For the last 4 years the annual examinations of the Massachusetts Ten Year Survey, conducted by the State Department of Public Health in conjunction with the Lowell Division of School Hygiene, have brought to light the fact that the number of Lowell children listed as the hilum tuberculous, the latent tuberculous, the suspects, and the contacts, formed surprisingly large groups. This hurt civic pride. A more startling fact, however, was revealed—that these groups, all of which came under the broad classification of the pretuberculous and underweight, made each year no worthwhile progress.

It was found that, while the examination of the children and the work of the teacher and school nurse, including advice to parents, were effective during the school year, during the summer months the results were largely lost. Though vacation should have been the pe-

* A resumé of an intensive summer campaign in health camp and health center.

riod of greatest gain, it was worse than wasted time. Knowing what these conditions meant for the future of the children and the community, and that there was no hope of passive acquisition of good health by these groups, the health department realized that if any material progress was to be made, the city must put forth its maximum of effort through the entire year, and that the break in the campaign for child health, from June until September, must be closed.

PLAN OF CAMPAIGN

In 1927 the city had established a municipal summer camp, and a health center had been sponsored by the Tuberculosis Council. They were valuable as a beginning, but left much to be desired. The obvious duty of the health authorities was to improve them, and make them coöperative and effective. The 1927 camp was for the day only. Transportation was furnished to and from a central meeting place in the city, but much of the good accomplished during the day was neutralized by the fatigue of the journey between home and camp. Moreover, there could be no supervision of hours of sleep, food, or hygienic habits, and there was an ever-present fear that some children might be exposed to contagion and on their return infect the camp.

In 1928, the ideal type of summer health camp was established. The so-called " Day and Night Camp," in which the children spend the entire 24 hours, was put into operation. It is, in several respects, ideally situated.

While the site is within the city limits, it has all the advantages of a country location. Although adequately isolated from dwellings and from contact with the more thickly populated city districts, it is easily accessible to parents, both by automobile and electric railway. Regulations, not too stringent, and easily enforced, prevent too many visitors at hours that might disrupt camp discipline and routine.

The grounds, some 10 acres, well grassed and drained, are on a fair elevation above the surrounding country. Northward is the valley of the Merrimac, and a clear, unobstructed view of the White Mountains in the distance. A grassy slope gives space for play, and a large oak makes a natural playground center with ample shade.

A wealth of recreational apparatus, practically all donated by the Lowell Gas Light Company, includes fifty swings, chutes, teeters, sand boxes for the very young, and athletic paraphernalia, basket balls, footballs, push-balls, volley-balls, a basket ball course, quoits and rainy-day and piazza games. A row of outside showers, with platform, made up for the lack of a wading pool, and were of practical use in the bathing of the children at the opening of the camp.

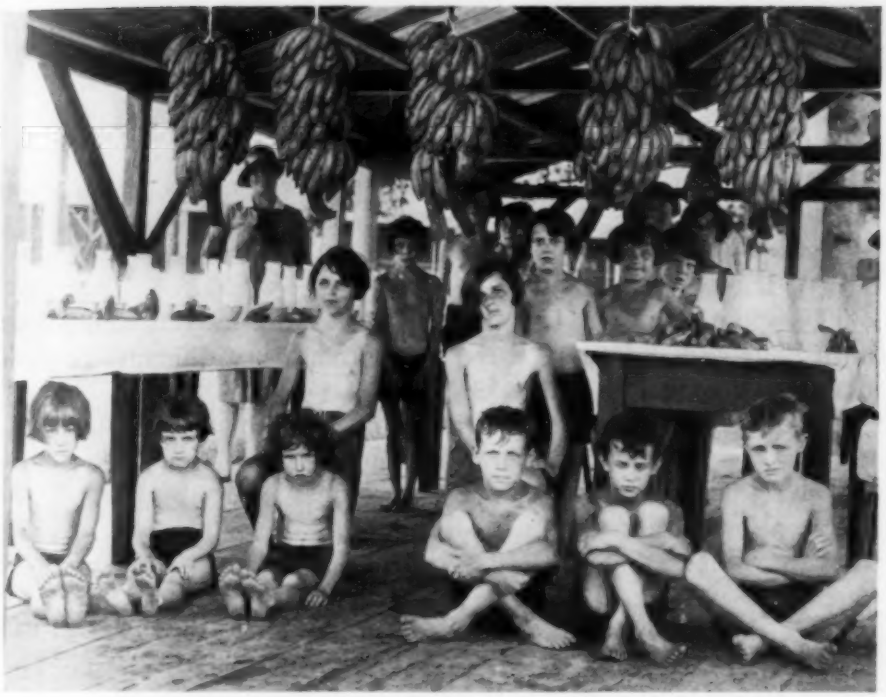


FIGURE II—Dining Pavilion, ready for milk and banana morning lunch

Permanent buildings capable of housing 125 to 140 children constitute the camp quarters. The main building has two wings, one used as sleeping quarters for the girls, and the other for the boys. Regulation iron hospital beds with mattresses, bed covering and linen, without pillows, are provided. A central administration building contains the director's office, nurses' quarters, and platform for scale and weight charts. There are two smaller buildings, one containing the kitchen and commissariat, with attached out-door, roofed dining pavilion, which accommodated the entire camp at meal time (Figure II), and the other a duplex toilet.

Sanitation of summer camps presents an important problem. The majority, because of their location, have no sewer connection, so that septic tanks and wells must be installed for disposal of excreta and waste. This was the method employed at the Lowell camp. Garbage and other waste were removed by health department employees every second day. An uncontaminated and plentiful water supply was available through connection with the city mains.

The personnel of the camp consisted of a director, 8 graduate nurses, 5 of whom had more than one year's experience in this type of work. Of the other 3, 1 was a school nurse who had had previous

contact with many of the children, and the other 2 were surgical nurses who spoke more than one language, mainly French. This was quite important in advising the parents of some of these children on their visits to camp. The value of a thoroughly trained and capable personnel cannot be emphasized too strongly.

The day shift comprised 3 nurses, a dietitian and her assistant, who were also nurses, and a physical instructor who acted as day custodian. The night shift was made up of 2, and for a time, 3 nurses, and a night custodian.

The camp was open practically 8 weeks, during July and August. Both boys and girls were cared for without any difficulty or undesirable incidents.

The selection of the children is of paramount importance and must be carefully made if the maximum value of such work is to be realized. Those selected should comprise the groups most in need of attention, either because of physical defects or a lack of health knowledge in their homes; they should be free from infectious diseases, and not recent contact with contagion.

The plan followed, recruited from the schools those listed in the Ten Year State Survey and by the school physicians and nurses as being among the hilum tuberculous, either active or latent, suspected or contacts with open cases, or those showing malnutrition as evi-

FIGURE III—The Sun Bath

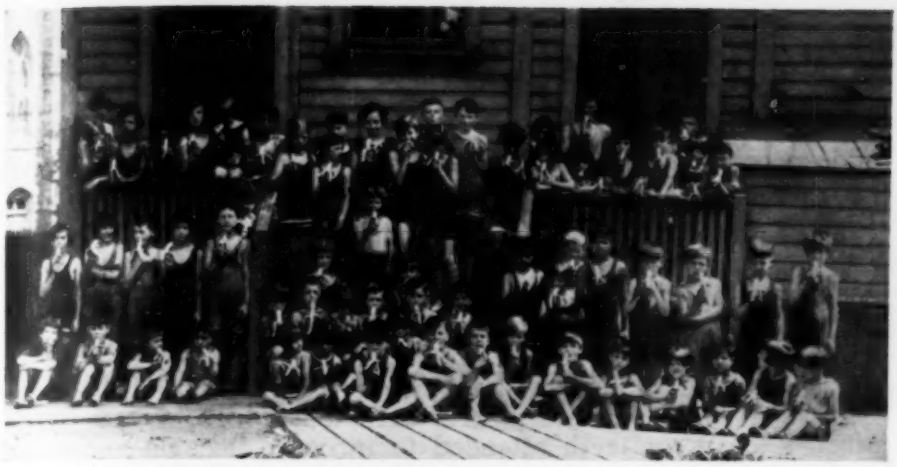
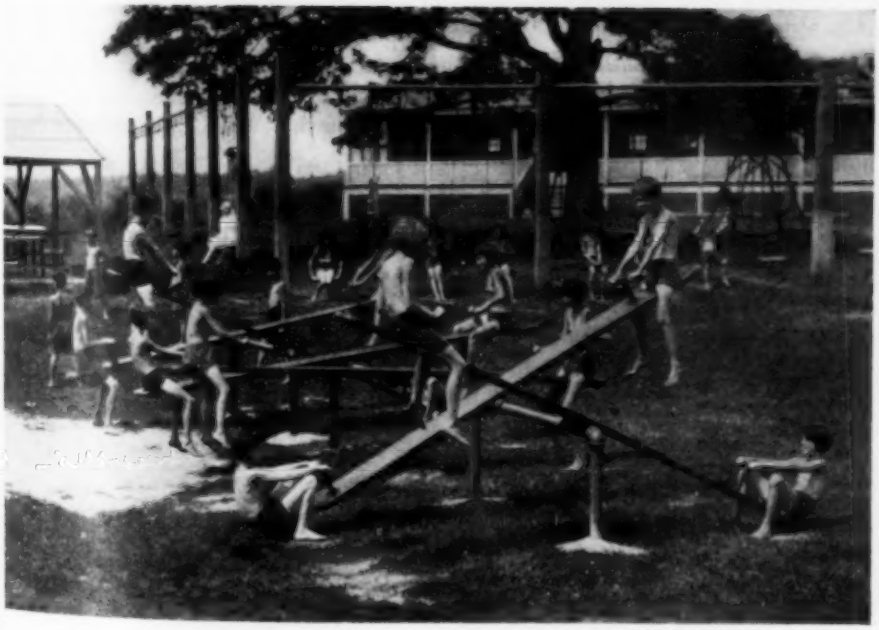


FIGURE IV—Morning Lunch Hour at Edson School Health Center



FIGURES V and VI—The Playground showing sand pile for younger children and vigorous activity which the children acquired as summer advanced

denced by being at least 10 per cent underweight. In addition some children recommended by private physicians and outside agencies were accepted. Before the opening of camp the candidates were given an examination to discover carriers of disease, or detect those from homes harboring contagious diseases. All suspicious throats were cultured. This also gave an opportunity to have carious teeth remedied before the opening of camp. During the school year a large percentage of the children recommended for the summer health camp were encouraged by the school nurses to have such foci as infected tonsils or teeth attended to in order that they might be eligible.

The average daily attendance at camp was 93—58 girls and 35 boys—augmented by 50 children during the last 2 weeks. These 50 had already received considerable preliminary training by continuous attendance for 6 weeks at the Edson School Summer Health Center, and were cases which, it was believed, would benefit to some extent even from the short time at the health camp.

DAILY SCHEDULE

7:00	*A.M.*	Out of bed. Roll call. Attention to personal hygiene, hands, face, teeth, under supervision.
7:20		Assembly for breakfast. Washing of personal dishes.
7:45		Arrangement of personal quarters, which included the making of beds by the older children. (Policing of the buildings, sleeping quarters and grounds performed by adult custodian.)
8:00		Recreation. Supervised play.
9:30		Heliotherapy. One-half hour maximum, lying prone on sheets in grassy play field in front of main building.
10:30		Mid-morning supplementary lunch. Milk and bananas, varied with crackers.
11:20		Postural exercises for selected groups.
11:40		Health talks in shade by nurses to their individual groups.
11:45		Preparation for dinner. Washing of hands. Assisting, and arranging noon meal.
12:00		Dinner.
1:00	*P.M.*	Rest period, in sleeping quarters, prone on bed.
3:00		Up and out in open.
3:30		Mid-afternoon lunch, milk and bananas. (Sometimes partly devoted to rehearsal of health plays for demonstration open to public.)
5:30		Assembly for supper.
6:15		Attention to personal eating utensils.
6:30		Play, campfire singing, games, story telling.
7:30		Chilly night, mug of hot cocoa.
8:00		Bed. Quiet.

This schedule was closely adhered to, with the exception of special occasions such as rainy days, when the rest period was prolonged.

The doctor, who was also Camp Director, made a daily visit to the camp, and frequently a second one in the evening. Daily medical inspection by the nurse in charge of each group was religiously carried out. Any children showing a rise in temperature or malaise were immediately quarantined, their personal effects segregated, all contact with the rest of the camp severed as far as possible, and measures against the possible spread of contagion, such as throat cultures, immediately taken.

MEANS TO HEALTH

Heliotherapy—The sun treatment was carried out in accordance with the most approved technic. The children, after becoming accustomed by increasing dosage to the direct rays of the sun, were gradually divested of clothing until only trunks were worn. This also had for its purpose what is almost as important as the sun bath, that is, the air-bath, to as much of the surface of the body as possible. In carrying out the sun treatment, careful watch was kept for the possibility of over-dosage and no untoward effects were noticed. A deep pigmentation of all those at camp was secured (Figure III).

Rest and Recreation—While recreation is of major importance in the summer health camp, these children, undernourished and underweight, need rest rather than strenuous exercise, because one of the important factors in bringing about this condition is over-fatigue, to which the child of school age is highly susceptible. The problem is to correct this over-fatigue and neutralize the toxic fatigue products. This can be done only by rest, and by this is meant complete relaxation, prone on bed or cot, as provided for in the daily schedule.

This chronic fatigue of the school child is usually due to lack of sleep, faulty food or health habits, and poor home hygiene, intensified often by too much outside work. It is also a fact that sometimes, because of the compulsory education law, the child is required to spend a large part of his waking day within school walls under more or less strict régime and at definite tasks, deprived of the fresh air and sunshine which he enjoyed during his preschool period. For this reason stress was placed on the length of the daily rest period.

Diet—Faulty diet plays a far greater part than was formerly supposed in bringing about not only malnutrition in children but also the degenerative diseases of adults. The ills due to a partially deficient diet, that is, one deficient in such mineral salts as calcium, the vitamins and the essential amino-acids, are of frequent occurrence.

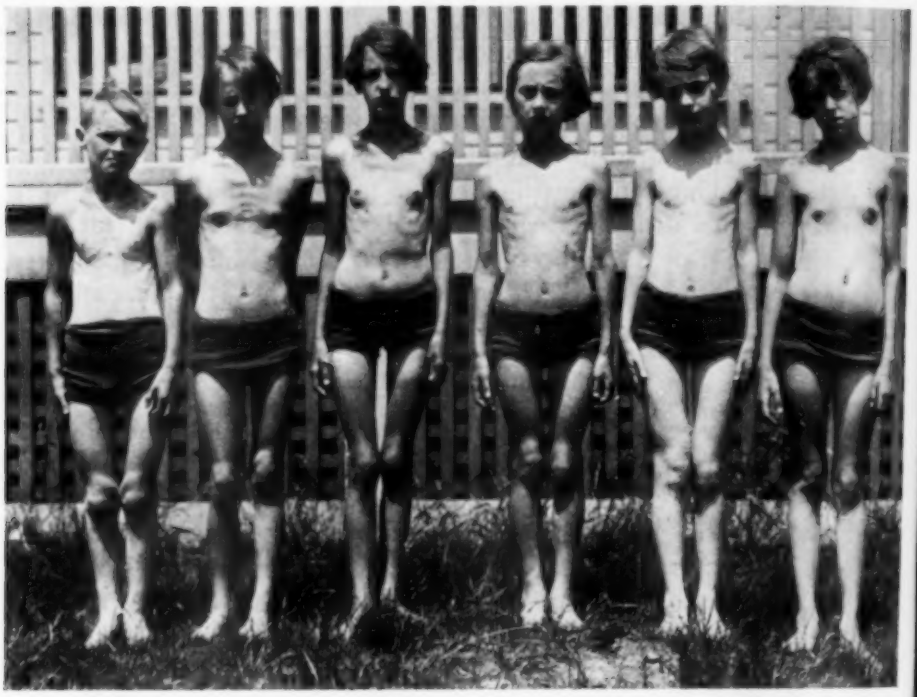


FIGURE VII—Group which includes some of the most needy children taken at the end of the first 16 days. Children Nos. 2, 3, and 4 unfortunately left before the end of the camp session. They returned to school not improved.

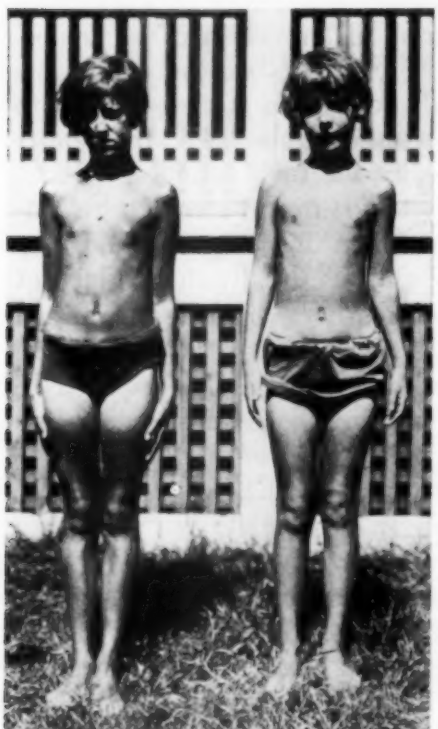


FIGURE VIII—Florence P. and Lucy N., the two children at the right in Figure VII at the close of camp. The marked improvement in posture and good effect of the sun treatment are readily seen. Their records are:

NAME	AGE	HT.
Florence P.	12	57
Lucy N.	10	56½

	WEIGHT BY WEEKS								
NAME	1st	2d	3d	4th	5th	6th	7th	8th	Normal
Florence P.	64½	70½	72½	72½	74	75	75	76½	82
Lucy N.	62½	63½	65½	67½	69½	72	72½	74½	78

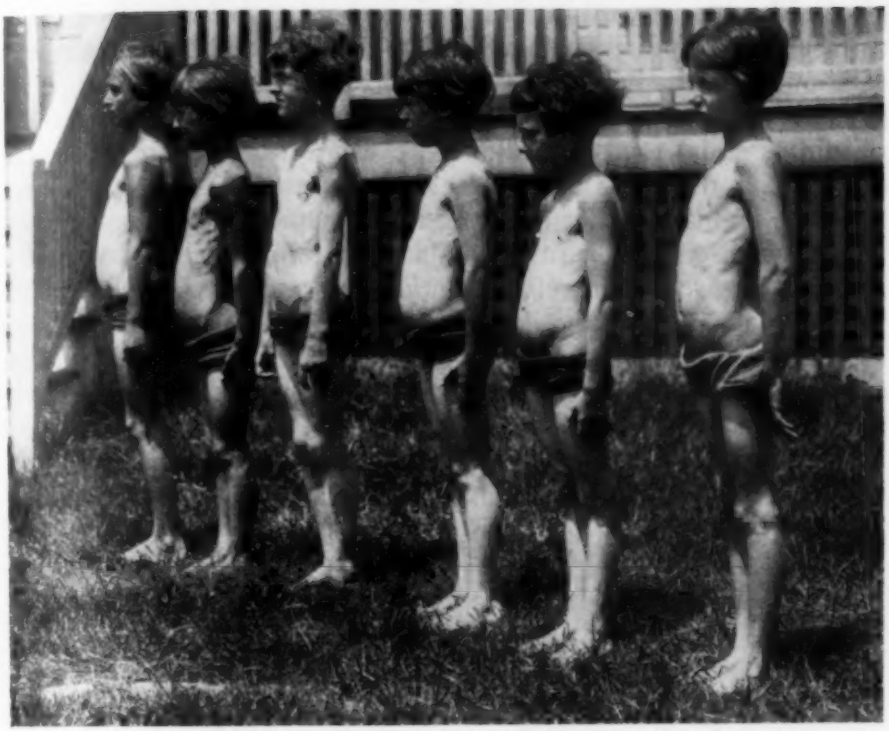


FIGURE IX—Group taken at end of the first 16 days. Their records are:

NAME	AGE	HT.
Jennie G.	9	53
Gladys K.	10	47½
Mary F.	Left	
Grace C.	9	47
Theresa B.	7	44½
Delia G.	Left	

WEIGHT BY WEEKS

NAME	1st	2d	3d	4th	5th	6th	7th	8th	Normal
Jennie G.	52½	54½	56½	57	57½	59	59		67
Gladys K.	45½	47½	48½	50	51½	52½	52½	54	50
Mary F.	Left								
Grace C.	44½	44½	45	47½	47½	49	49½	50	50
Theresa B.	40½	42½	Tonsil-lectomy	43½	45½	47½	48	50	45
Delia G.	Left								

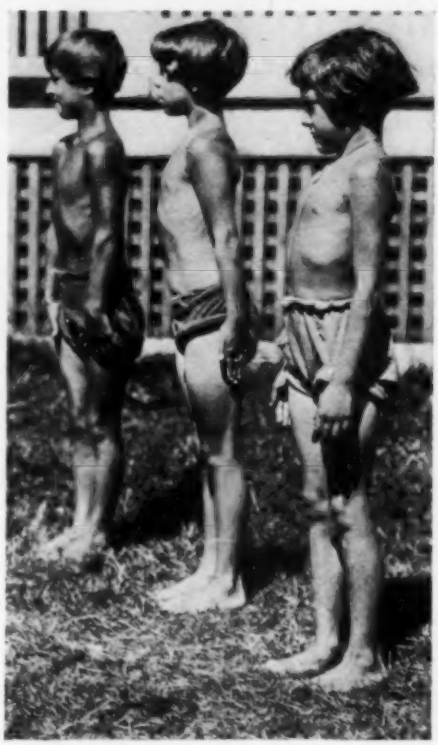


FIGURE X—Three who remained of group shown in Figure IX at the end of camp—Gladys K., Grace C., and Theresa B. While the posture may seem exaggerated, it shows an excellent appreciation of what constitutes correct posture, when on display.

Although the economic condition of the family may be a factor of considerable importance in bringing about such faulty food habits as result in malnutrition, nevertheless equally important is the lack of knowledge of what constitutes a correct and balanced diet. One result is that fickle food habits and unwarranted prejudices against certain essential foods are allowed to exist in children, and because of these, improper and inadequate diets for normal growth are found not only among the poor but even in the homes of the wealthy. As regards children, diet is in the main a matter of health education.

For these reasons careful attention was paid to this phase of the work. Not only was the daily menu compiled with great care, and attention to the requisites for nutrition and growth, but foods were chosen and menus arranged in such a manner that they could be provided and served in the homes to which these children would return. The purpose was to secure a correction of faulty food habits which might be continued after the children returned home.

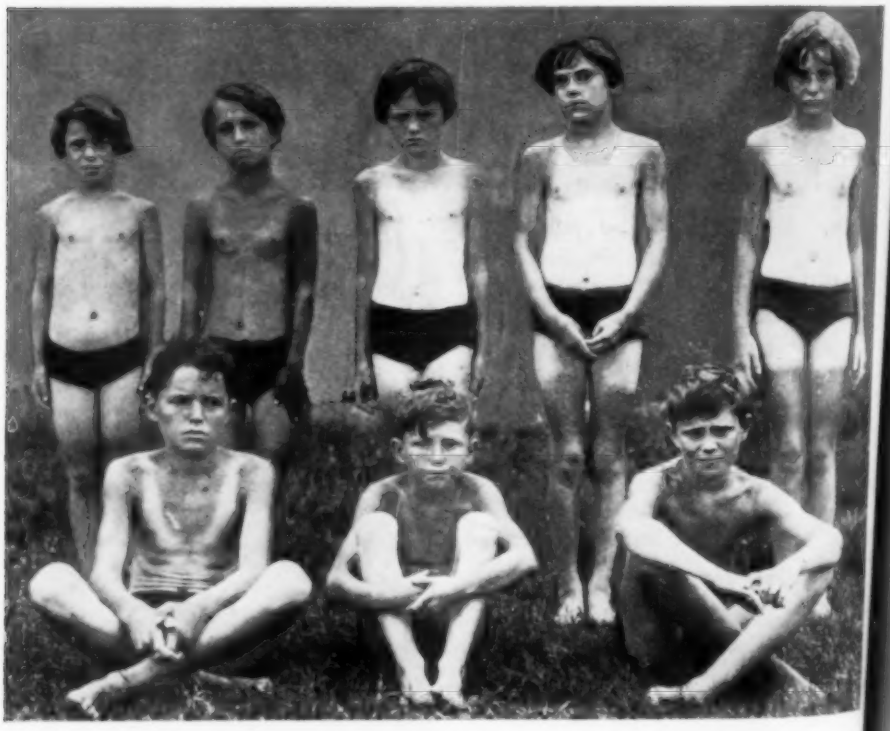


FIGURE XI—A typical group at the end of the first 16 days. Their records are:

NAME	AGE	HT.	WEIGHT BY WEEKS								
			1st	2d	3d	4th	5th	6th	7th	8th	Xmas
Grace C.	9	47	44½	44½	45	47½	47½	49	49½	50	
Gladys K.	10	47½	45½	47½	48½	50	51½	52½	52½	54	
Agnes Mc.	10	50½	50½	52½	55½	55½	56½	58½	58½	60½	
Eleanor W.	10	53¼	59½	63½	64	66	66½	67½	68½	69½	
Mildred M.	10	55	65½	64½	65	66	66	67½	66½	68½	
Stanley R.	12	59	80	80½	83	84	85	84½	86	86½	
George M.	8	50	54½	53½	54½	55½	56½	56½	56½	57	
John O'C.	11	56½	66½	68	69½	72	72½	73½	74	75	

Since this phase of the work was essentially educational and its success depended upon continuity and perseverance of effort, certain follow-up work was necessary. The parents of these children were supplied with a mimeographed sheet containing a list of foods for breakfast, dinner, supper and the between-meal lunches, such as were given at camp, and which contained the necessary nutritive elements for child growth. This list is almost identical with that furnished by the State Department of Public Health.

Milk and bananas were chosen again this year as a supplementary lunch, not only because they furnish a complete food when used together, due to the fact that the ratio of carbohydrates and fats to proteins makes a well balanced diet, but also because the ripe banana is palatable and easily digested and assimilated. The combination also contains adequate amounts of vitamins A, B, and C, and the essential mineral salts. This choice of a milk and banana diet was due not only to its adequacy as a supplementary lunch for those children who were in special need of extra nourishment, but also to create a taste for a palatable food which might replace concentrated carbohydrates in the form of candy, or other sweets, between meals.

SOME HEALTH CAMP MENUS

Sunday

Breakfast

Oranges
Shredded wheat
Bread and butter
Milk

Sliced banana
Shredded wheat
Pep
Bread and butter
Milk

Dinner

Chicken fricassee
Mashed potato
Green peas and onions
Milk and ice cream

Pot roast
Baked potato
Peas
Bread and butter
Ice cream

Supper

Chicken soup
Baking powder biscuit
Banana and peach salad
Milk

Sandwiches
Canned pears or peaches
Milk and cookies

Friday

Breakfast

Stewed prunes
Sliced banana
Pep
Bread and butter
Milk

Oranges
Oatmeal
Bread and butter
Milk

Dinner	
Fish chowder	Fish chowder
Bread and butter	Green corn
Milk	Banana fritters
Stewed peaches	Peanut butter sandwiches
	Milk
Supper	
Tomato soup	Banana salad
Boiled rice	Bread and butter
Fruit salad	Milk
Bread and butter	Cream of pea soup
Milk	
	Saturday
Breakfast	
Oatmeal cereal	Dried peaches stewed
Sliced banana	Pep
Milk and top milk	Bread and butter
Bread and butter	Milk
Dinner	
Meat loaf	Pea soup
Mashed potato	Spinach
Brown gravy	Junket
Creamed carrots	Bread and butter
Banana and cream souffle	Milk
Bread and butter	
Milk	
Supper	
Baked beans	Scrambled eggs
Corn cake	Blueberry cakes
Milk	Bread and butter
Banana pudding	Milk and bananas

There were also mid-morning and mid-afternoon lunches of bananas and milk, sometimes varied with crackers. On chilly nights hot cocoa was served at 7:30. The children were not permitted to receive or accept gifts of food.

THE EDSON SCHOOL HEALTH CENTER

Inaugurated in 1927 and financed by the Lowell Tuberculosis Council as an experiment under the supervision of the Director of School Hygiene, the Health Center at the Edson School has developed into an important phase of municipal health activity. Its success warranted the appropriation of additional funds from the Council for the expansion of the work the following year.

A director without pay and a full-time nurse with salary, assisted by several volunteer workers, formed the personnel of this center, which was conducted 5 days a week with morning and afternoon

sessions, beginning at 9 and closing at 4:30. The average attendance was 125. Weighing and measuring, with physical examination of all children enrolled, was done and recorded on admission. The daily program included mid-morning and mid-afternoon lunches of bananas and milk, postural and corrective exercises, health education by daily talks, health plays and pageants and such activities as making health posters, illustrating nutritious foods by cut-outs from advertisements and pictures, with toothbrush drills and instruction in personal hygiene. In addition to this, on certain days each week, diphtheria prevention work was carried on by a volunteer corps of physicians assisted by health department nurses, through the administration of toxin-antitoxin to children of preschool and school age. Infant welfare work was carried on under the supervision of a pediatrician, and consultation with an eye, ear, nose and throat specialist was provided for all cases requiring it. The fact that on various occasions 40 or 50 parents visited the center in one day, and that many notes and inquiries were received concerning their children's health, showed that this clinic was making contact with groups heretofore difficult of approach, and that these groups were being enlisted under the banner of good health.

Supplementary lunches were provided, consisting of a ripe banana and a pint of milk morning and afternoon, varied occasionally by crackers and ice cream. The completeness and nutritive value of this food as a supplementary lunch to the ordinary meals was evidenced by a gain in weight of from ¾ to 2¼ pounds during the period that the health center functioned. (Figure IV shows the morning lunch.)

Amazingly good discipline was evidenced at both health center and camp. In the few instances of infractions of camp rules, just penalties were inflicted immediately, and took the form of increased rest periods, even up to an entire 24 hours in bed.

These were few but noteworthy. We regret that several of our most needy cases stayed but a very short time, due in part to inopportune visits from parents either alone or accompanied by former playmates of the children, or members of the same family of about the same age, during the first week of camp. These visits, coming at the only time when the children felt any homesickness, caused a few to return prematurely to their homes. Others, because of ignorance on the part of the parents, were taken from camp on refusal of the authorities to allow the children or visitors to go and come when they pleased. A signed agreement from these parents guaranteeing a stay of 8 weeks would have eliminated these difficulties.

Finances for this type of camp were voted by the health department, due in no small part to the popular demand created by the Lowell press in timely publicity and endorsement of the value of this work, and through the sponsorship of certain agencies actively concerned with community health and civic welfare, such as the Lowell Tuberculosis Council, the Lowell Chamber of Commerce, and many of the city officials.

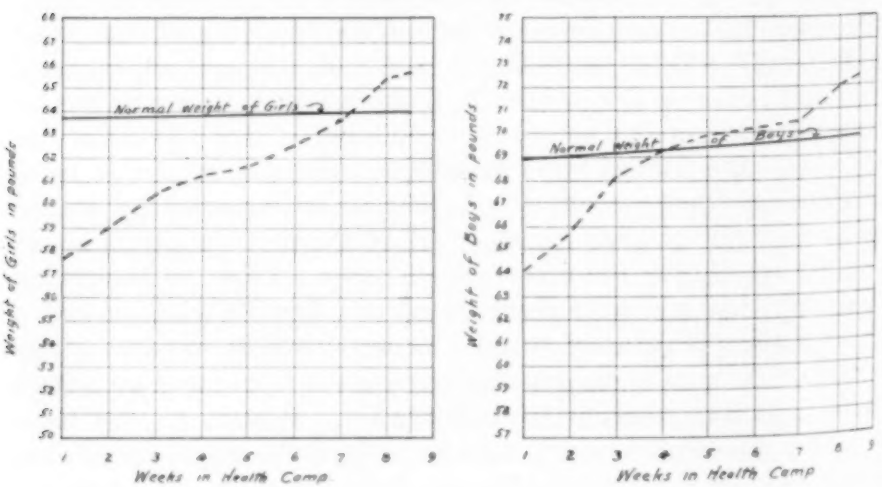
The success of the camp was due to a great extent to the men forming the Lowell Board of Health. Awake to the great possibilities of this work in improving the health of the children, they rendered every assistance possible to the Director of School Hygiene.

RESUMÉ OF WORK ACCOMPLISHED

The beneficial results of the summer session of the Lowell Health Camp were threefold.

1. Improvement in the physical condition of the children was evidenced by an average gain in weight of over 7 pounds; a bright and happy appearance as contrasted with an apathetic and listless attitude on entrance; vigorous activity; improved muscular tone; a skin healthy in appearance and firm to the touch, with a deep pigmentation of practically the entire body; better posture, with a lessening of the fatigue posture characterized by " winged " shoulder blades, curved back and marked ptosis of abdomen common to practically all at the time of entrance; and the ability and willingness to eat the simple, correct and nourishing foods which comprised the camp menu.

COMPOSITE WEIGHT CHARTS


Normal Weight of Girls
Weight of Girls in pounds
Weeks in Health Camp
Normal Weight of Boys
Weight of Boys in pounds
Weeks in Health Camp

2. The acquisition of considerable health education was shown by a voluntary adherence to the precepts of personal hygiene, such as cleanliness of face, hands and body, improved oral hygiene, attention to appearance, and care of personal property. In addition, every child had a positive knowledge of what constituted a correct diet and an appreciation of the value of fresh air, sunshine and sufficient rest.

3. There was inculcated a very definite respect for constituted authority and for the rights and privileges of the other members of the camp, which, together with a healthy body and a sound mind, are the qualities which go to make a desirable and welcome future citizen.

VALUE AS A HEALTH DEMONSTRATION

For the success of any program intended for the betterment of child health the coöperation of the public is necessary, and to secure this an educational health crusade must be promulgated. In gaining this appreciation and coöperation, such demonstrations as summer health camps and summer health centers are very efficient agents, the more so because, generally speaking, health departments are handicapped by the failure of the adult population to recognize in their work something of immediate and tangible value to themselves. The success of these health programs depends to a great extent on the amount of health education " sold " to the public. It is not too far-fetched to say that preventive medicine as a whole is three-fourths educational.

No better form of advertising for any city is possible than the knowledge that the health of its children—the future citizens—is receiving the consideration and attention which it should. Disraeli once said: " Public health is the foundation on which rests the happiness of the people and the welfare of the state." It is to the credit of the city of Lowell that it maintains for its undernourished children perhaps the only, and certainly one of the very few, municipally financed summer health camps in the United States.

The Outlook for Mortality Statistics by Occupation*

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OCCUPATION is one of the factors which determine the death rate; a double factor, made up of the direct hazards, which affect only the worker, and of the attendant living conditions, which affect both the worker and his family. The presentation of adequate statistics of deaths classified according to occupation ought, therefore, to form a part of any comprehensive program for vital statistics. It remains to determine at just what point this feature should be taken up, for there are many other items, some of them of much more immediate importance, and nearly all of them easier of accomplishment. The logical procedure would seem to be to let the matter of occupational classification wait until the more urgent features had been established, or were well on the way toward a satisfactory status.

The census reports of 1890 and 1900 gave considerable space to the classification of deaths, not only by occupation, but by occupation with age and cause of death, but the mortality statistics up to this time were very imperfect. The reporting of deaths by the census enumerators had failed to obtain even the total number. The transcription of state records in a limited registration area had been used to supplement the enumerators' work in 1880 and 1890, but the idea of extending this method and making it the basis for annual statistics of mortality was only taking definite form in 1900.

For the 25 years following 1900 the main effort of those in charge of collecting vital statistics for the United States was directed to the extension of the registration area and the improvement of the returns both in quality and in completeness. In 1915 the compilation of birth statistics was begun and a birth registration area established. This met a need far more urgent than any amplification or further classification of the death statistics.

Gradually, states have been added to the registration areas for deaths and births, 44 being now included, with about 95 per cent of

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

our population; and for most of this territory the number and causes of deaths are satisfactorily reported. We may now divert a bit of our time to classifying the death returns by occupation.

The first thing is to find out what materials are at hand and to what extent they are in shape to meet the new requirements. Tabulations of deaths classified by occupation have been made for some of the years between 1900 and the present. Tables of deaths classified by occupation were published in the reports for 1908 and 1909, though without any rates, since parallel figures for population were not available for years so long after the census year. In 1910 the tabulation was again made and rates were computed; but the results showed so much inconsistency and so many relations that did not seem reasonable that the tables were never published. The experiment was repeated in 1920, with results still unsatisfactory. These attempts establish the fact that the disinclination of the U. S. Bureau of the Census to publish occupational mortality figures under present conditions is based on a realization of the imperfections in the material rather than on inertia or lack of appreciation of the importance of the subject.

For the computation of death rates for occupational groups, two kinds of material are needed: deaths classified according to occupation, and population data classified in the same way. The occupational classification of the two factors must be made, so far as possible, on a uniform basis. Any adequate interpretation of the death rates when computed requires also some age classification; for in many cases a high death rate for a given occupation taken as a whole will appear upon analysis to be primarily the result of the high average age of the persons engaged, or *vice versa*. The death rate for farm operators, for example, will certainly be far higher than that for farm laborers, because the latter are mainly young men. Some classification by cause of death will also be needed, since the influence of occupation on mortality frequently takes the form of an increased (or decreased) likelihood of death from certain specific diseases.

One of the principal difficulties in compiling occupational mortality statistics is that of securing accurate returns on the death certificates. A recent examination of more than 1,500 certificates, selected from representative areas, showed that only about 70 per cent contained occupation returns sufficiently complete for a satisfactory classification. Among the inadequate returns the most common defect was the entry of some indefinite term, such as " clerk " or " laborer," without any statement as to the industry or business. While information as to the industry is not absolutely required in all cases, it is essen-

tial to the classification of laborers and some other groups of workers; and there seems to be no way of insuring its presence when needed, except to insist on having an answer to the question covering this point on all certificates.

The occupation returns on the general census schedules are not all complete and satisfactory, but the proportion of unsatisfactory ones which have to be given an arbitrary classification or thrown into some residuary group is much less than 30 per cent. Entries in other parts of the schedule, and for other members of the family or residents of the locality, often prove of material assistance in classification, where this is made for the whole population. Such assistance is entirely wanting, of course, in the isolated cases represented by the death certificates.

The occupation returns on the death certificates ought to be at least as accurate as those made by the enumerators on the census schedules. In both cases the information is usually obtained from members of the family. The undertaker, physician, or other informant is probably more intelligent and more accurate than the average census enumerator; further, he is recording information with regard to occupations almost daily and not, as in the case of an enumerator, for a brief period once in 10 years.

The two primary occupation questions on the standard death certificate are similar in a general way to the corresponding ones on the population schedule, but there are minor differences in form; and these may be in part responsible for the less satisfactory returns on the death certificate. The occupation questions on the death certificate are as follows:

8. OCCUPATION OF DECEASED
(*a*) Trade, profession, or particular kind of work .....
(*b*) General nature of industry, business, or establishment in which employed (or employer) .....
(*c*) Name of employer .....

For the sake of making the death certificate uniform with the population schedule it is proposed to revise this section to read as shown on the next page—substituting two new questions (numbered 10 and 11) for the "Name of employer," which seems to serve no particularly useful purpose:

OCCUPATION

8. Trade, profession, or particular kind of work done, as *spinner, sawyer, bookkeeper,* etc. .....

9. Industry or business in which work was done, as *silk mill, sawmill, bank,* etc. .....

10. Date deceased last worked at this occupation (month and year) .....

11. Total time (years) spent in this occupation .....

It is believed that the listing of specific examples of the kind of entries desired under both trade and industry will make clear the requirements for these two questions in many of the cases where the distinction has not been clear heretofore, and that the importance of answering both will be more evident if they are given independent numbers, " 8 " and " 9," in place of being presented as subdivisions " (a) " and " (b) " under a general designation.

More serious than these minor differences in the form of the inquiry on the face of the standard death certificate would seem to be the statement in the instructions on the back: " For many occupations a single word or term on the first line will be sufficient." This is followed by an explanation of the fact that in other cases entries are required both on the first line (trade or specific occupation) and on the second line (industry); and if the instructions, as they stand, were followed absolutely, the results would be satisfactory. The inevitable psychological effect, however, of the statement quoted, has been the return of numerous certificates with entries on the first line only, even though the cases were plainly included under specifications printed later in the paragraph and definitely calling for a second entry. It is believed, therefore, that a radical revision of the instructions, putting stress at the very beginning on the necessity for reporting both specific occupation and industry, coupled with the proposed changes in the form of the questions, will result in a great improvement in the returns; and that if this is accompanied by special emphasis on the necessity for making complete and accurate returns of occupations, the data will soon be in satisfactory form.

The new section proposed, including questions 10 and 11, need occupy no more space than does the occupation section on the present standard form. Question 10 is added as a basis for separating retired persons from those actively engaged in the occupation returned up to the time of death or the beginning of the illness which resulted in death. It is believed that a definite question like this will give more satisfactory results than any provision for returning persons as " re-

tired." Question 11 is designed to give some information with regard to change of occupation, which is probably more frequent among American workers than among those in any other country.

Since it will doubtless be expedient to start the publication of occupational mortality statistics in a relatively small way, rather than to undertake to cover the whole field in the first year, it has been suggested that for a time the presentation be limited to statistics for males; and even to those for males 20 to 64 years of age.* The connection between occupation and mortality is far more direct and important with males than with females, since 92.6 per cent of the male population 16 years of age and over are gainfully employed, as compared with 23.9 per cent of females. The connection is doubtless far closer with males within the suggested age limits than with either those under 20 years or over 64; for the former have had only a brief experience in any occupation and the latter are approaching that period in life when death is imminent, no matter what the occupation may be. Another factor which is rendered less serious by the omission of persons over 64, is retirement. Many persons dying in old age will have retired from gainful occupation some years prior to their death, but frequently, in spite of all precautions, the earlier occupation will be reported on the death certificate with no indication of the retirement.

It is proposed to base the occupational death rates on the number of gainfully employed persons regularly returned in the census of population, which does not include retired persons. Presumably, these should be excluded also from the number of deaths used in computing the rates, though this does not necessarily follow. It would seem illogical to include retired persons in the deaths and not in the basic population; but in practice this combination might yield the more significant results. It would take account of one additional factor, the variation in the relative number of deaths from retired status in the various occupations (and from the various causes of death); and except for this the rates would run parallel with those based on the complete elimination of all "retired" cases, only on a uniformly higher level.

An alternative plan which has been seriously considered is that followed in the English census, where the attempt is made to include all retired persons,† classified according to the occupation followed prior to retirement, both in the number of deaths and in the population

* The statistics presented in the English report on occupational mortality for 1921 relate mainly to the age group 20 to 65.

† The basic population group under consideration in most of the tables in the English report on occupational mortality is "All occupied and retired civilian males."

groups. This method would perhaps be the ideal one if it were possible to obtain the required information with accuracy and facility. Even in England, where the institution of vital statistics has been established for a much longer period than in the United States, it is admitted that the population statistics for a given occupation fall considerably short of including all retired persons who had followed that occupation.

One of the important considerations in favor of basing occupational death rates on data for the gainfully employed population, exclusive of retired persons, has been that of expediency. The process of classifying the returns of the decennial population census according to occupation is a task far greater than any other one part of the work leading to the publication of occupational mortality statistics. From the beginning, the practice has been to include in the various occupational classifications only those persons actively engaged in the occupation at the time of the census, or temporarily idle on account of failure to find employment. To expand this group to include both the gainfully employed and the retired population would result in some confusion and in somewhat less accurate classifications, in addition to making a material increase in the work.

The requirements of expediency were supported, however, by a feeling on the part of some members of the staff of the Bureau of the Census that death rates based on fairly good data excluding retired persons would be at least as significant as those which might be based on imperfect returns for all persons who had pursued the various occupations, including those retired; and in particular, that the relation between the rates for one occupation and another would be typical and significant.*

Further, in spite of the English precedent, there is ground on which we might question the validity of including both retired and occupied in one total and treating the combination as a unit in computing death rates. In many occupations the death hazard of those at work is decidedly greater than that of those who have retired for reasons other than disability resulting from the occupation. This is especially true in occupations where the likelihood of accident or the results of exposure are important factors, as, for example, coal miners or telephone line men. Retirement on account of disability would usually connote an increased likelihood of death. In either case there is reason for insisting that the two groups should not be mixed—that if statistics

* These relations would not be identical, of course, because of the variation in the relative numbers of persons retired from the various occupations; but one might contend that while two curves representing the two sets of rates for a series of occupations, one based on the occupied population and one on "occupied plus retired," would not run absolutely parallel, they would correspond rather closely in their major ups and downs.

are to be presented for the retired, they should be kept entirely separate from those for persons actively employed. Here is a field in which we ought at least to do some preliminary experimental work, so as to know positively what will be the effect of combining these two elements.

Something like this is what we have in mind for the immediate future program in the Bureau of the Census. It is proposed to make a careful study of the extent to which occupations are normally returned for retired decedents, which will be indicated by the replies to question 10 (date of last active employment) in the revised form of the death certificate. It is proposed also to make a study, on the basis of the replies to question 11 (total time spent in this occupation), of the extent to which men change their occupation, giving especial attention to the changes taking place after middle life, which may prove to be a more serious disturbing factor in American statistics of occupational mortality than the matter of retirement. On the basis of definite information secured from these studies, it will be possible, as the work develops, to make any changes in the general plan that may seem profitable.

One further limitation imposed by the dictates of expediency will restrict the value of the occupational mortality statistics which can be compiled in the immediate future. Many of the occupation classifications now employed represent so large a group of specific occupations, including persons working under widely different conditions, that they will not bring out in any positive fashion the effects of occupational hazard. In fact, it seems likely that for the first few years the really significant occupational mortality figures will be the rates for a relatively small number of occupational groups, including those in which the conditions of employment are relatively uniform and those which by reason of a definite and universally used occupation designation will be most accurately returned both on the population schedules and on the death certificates. The first stages of improvement will come with the gradual increase in the accuracy of the occupation returns. Later, when the social value of these figures has been demonstrated, it may be possible (and justifiable, in spite of the expense) to make extensive subdivisions of the present occupation groups to segregate those classes subject to particular occupational hazards. The major consideration at the present time, however, would seem to be the formulation of a program which is simple enough to be immediately practicable, and which will at the same time provide enough detail to be of positive and appreciable value.

A Swan Song in Public Health Work

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IN THE midst of the controversies of the day as to how much we are really gaining or losing in the fight against disease and the raising of the level of life for mankind, it is a bit of relish indeed to pick up the report of a man retiring from the active field of public health work, who was in at the beginning of the century, who kept faithful records through the intervening years, and in a simple short story now publishes the results.

In February, 1901, Dr. Richard King Brown took office as the first full-time Medical Officer of Health of the Borough of Bermondsey, England, a populous section of London, S. E., and his *Annual Report of 1927* to the Mayor, Aldermen, and Councillors closes a long and noteworthy official career.

Many changes have occurred in public health during this first quarter of the century, and Dr. Brown says that the advances have not occurred gradually, but by leaps at more or less well defined periods. The changes have been partly local, that is, confined to the borough itself, and also partly local expressions of national changes. A single table in the forepart of his report speaks volumes, and shows the important changes year by year from 1901 to 1927 inclusive.

Beginning in 1901 with 130,760, the borough, in 1927, had a population estimated at 121,000, composed of 29,284 families located in 18,034 houses. The reduction has been very largely due to the pulling down of certain buildings for improvements, but also to the replacement of houses by factories and the reduction in the birth rate, as well as to migrations to the suburbs.

The death rate has been reduced not quite by half, that is, from 20.8 to 12.9, and, while annual fluctuations have been marked, Dr. Brown feels quite safe in saying that the reduction is likely to be permanent. A more remarkable reduction is that of the birth rate, that is, from 34.2 per 1,000 in 1901 to 18.5 in 1927, and this also seems to be of permanent character, and by no means an unmitigated evil, because it has been paralleled with a marked reduction of infant deaths, and there is surely a correlation between the two.

The reduction in the infant mortality rate is considered to be

due chiefly to the reduction in the size of families. The very large families—10 to 15 and upwards—were not able to take good care of infants and the loss of a few was not looked upon as very serious. Families were huddled together in overcrowded houses, the result being that infectious diseases, particularly pneumonia and bronchitis, played havoc among the children. Another cause for reduction in the rate is probably the education of the mothers in taking care of infants, and this must be partly due to the rise of general education, and the special education undertaken by the municipal authorities and voluntary bodies under the stimulus of the Maternity and Child Welfare Acts. Other contributory causes, no doubt, are the rise in the rate of wages and the cheapening of food, but Dr. Brown thinks the first two causes mentioned have played a great part.

Very satisfactory reduction in tuberculosis, enteric fever, and smallpox is noticeable, but there seems to be no very material change in the prevalence of scarlet fever and diphtheria; in fact, they are inclined to increase, and the only thing that can be said of scarlet fever is that the form of the disease is much milder in this later day. We note no comment in Dr. Brown's report regarding immunization against scarlet fever or diphtheria; so in all probability his statements refer more or less to the natural status of these diseases left to the usual quarantine procedures. There was a serious outbreak of smallpox of 331 cases in 1901–1902, but since 1904 there have been altogether only 6 cases of this disease. Puerperal fever still remains a serious problem, and no doubt in the near future some method of reducing the mortality will be found.

Most interesting changes have taken place in the general condition of the inhabitants, especially the working classes, who now dress better and much more sensibly, and possess much greater general knowledge, especially in relation to health. There has been great improvement likewise in the cleanliness, ventilation, and general appearance of the homes.

Greatly increased sobriety prevails. There is no question that drinking is much less prevalent than it was 27 years ago. The appearance of a drunken man in the streets, which was by no means uncommon in 1901, was extremely rare in 1927. Here again, education has probably played the chief part, says Dr. Brown, though, no doubt, high taxation of alcohol, as well as the restriction of the list of sale, has had something to do with it. This condition should be looked upon as a great gain, and it can confidently be assumed that the population will be much more sober in the future, brought about, not by oppressive legislation, but by increased education.

The health department itself has been subject to important changes, from that of a part-time medical officer in charge, with a few assistants, to a department which is now composed, in addition to the Chief Medical Officer, of 7 sanitary inspectors; 7 district inspectors; 2 tuberculosis officers, assisted by 4 nurses and a caretaker; 2 medical officers for maternity and child welfare, assisted by 8 women health visitors; 1 full-time and 1 part-time dental surgeon, with 2 dental nurses and 3 prosthetic assistants; a convalescent home with a matron and nurse (with the admission of 255 women, 126 babies and 119 toddlers during the year); a public analyst; and a clerical staff consisting of 12 persons, in addition to a mortuary keeper, and a foreman disinfector. Some idea of the nature of the work of the department at present can be gained by a glance at this list of officers.

An interesting sideline has been a liaison with Dr. A. Rollier of heliotherapy fame, Leysin, Switzerland, by which not only were 6 beds for patients from the London Borough reserved there, and more or less completely occupied since July, 1924, but a solarium was also opened in the district itself in July, 1926, which proved of great benefit. Practically all of the patients are recommended for treatment in the solarium by the doctors from the various maternity and child welfare centers and from the tuberculosis dispensaries or hospitals. It is the first municipal solarium on any considerable scale in England, and has had visitors from all parts of the world. The attendance in 1927 totalled 24,322, examinations 2,226, new patients 456, maternity and child welfare patients 265, tuberculosis patients 107, and other classes of treatment 322. On the whole, cases of rickets and malnutrition have done well and shown very rapid improvement. The same may be said of antenatal cases, and the majority of these have returned after confinement for further treatments. There is little doubt about the value of light treatment in surgical tuberculosis if given cautiously, and none of the 18 cases of pulmonary tuberculosis treated has so far been injuriously affected, and in one or two cases the results have been gratifying.

Not an inconsiderable part of the detail work of the Health Office has had to do with the inspections of factories and workshops. During 1927, 630 such inspections were made in the district. Scores of defects in cleanliness, ventilation, sanitary accommodations, and other nuisances were found and remedied in the 413 workshops on the registry. Certain matters were referred to H. M. Inspectors of Factories and others were administered by the department itself. Observations upon smoke nuisances have formed a part of the health department's routine, with the filing of notices and summonses.

Among the later activities of the department has been health education, or propaganda, which was set up on a more extensive scale in July, 1924. The department has published a series of articles; given lectures in the open air, at schools and clubs; and, after investigating the films on the market, decided to make its own, which has proved very successful. The war opened the eyes of the nation to the value of public health work, as is shown by the tremendous and unremitting interest which the council now takes in the department.

It must surely be a satisfaction to the venerable Dr. Brown to submit an annual report of this nature as his epilogue, while health officials in America may well take heart and profit from his endeavors.

The gains described by Dr. Brown, sometimes enormous, can hardly be attributed to other than society's organized battles against disease and ignorance. Even the geneticists must acknowledge that no amount of natural selection or inheritance could bring about in one generation results such as these. We are pleased to note that even in a crowded section of London, and despite the vicissitudes of wars, unemployment, and traditional hindrances, none of which we can fully grasp in this country, even better progress has resulted than with us, and a part of it with less stringent laws. Detailed regulations are a characteristic of British procedures. There is, however, this marked difference in the British and the American methods—the former grasps the economic issue early and sees the wisdom of sidestepping politics in fundamental matters and of giving sound support in men and money to the projects which present themselves.

Leprosy Treatment

THE treatment of leprosy at the National Leprosarium, Carville, La., is progressing favorably. What is ordinarily considered cure, though not so designated by the authorities, is an accomplished fact.

In the seven years since federal acquisition, 31 patients have been discharged from the hospital—3 as not having been lepers and 28 paroled as "leprosy arrested and no longer a menace to public health." Of these 28, 1 (or 3.6 per cent) suffered a relapse and was readmitted, 4 having died (2 were examined at autopsy without tangible evidence of leprosy being found), and 23 are living and well and report periodically for reëxamination. The average age at which parole began was 44.8 years, and the average period of hospitalization was 6.4 years.

Of 718 hospitalized during 34 years, 215 were foreigners, 503 natives of the United States—418 came from Louisiana, and the others from California, New York, Texas and Florida.

Lead Poisoning in the United States*

TO YOUR committee it appeared desirable that its work be divided into two parts. The first is given over to an uncritical compilation of publications related to lead poisoning not limited to this country, since foreign achievements inevitably influence the incidence and control of lead poisoning in this country.

The second part is devoted to a number of unrelated items pertinent to the status of lead poisoning in this country during but not confined to the specified period.

THE DIMINUTION IN THE INCIDENCE OF LEAD POISONING

Several publications have commented upon the diminishing numbers of lead poisoning cases and deaths. Any proper estimate must recognize that the production and use of lead in this country is now more than double that for 1900, and the first decade of the century. In 1900 the production was 270,824 short tons; in 1927, 687,273; and 1926, 708,147 short tons. In view of this marked increase in lead manufacture and use it might be inferred that a correspondingly large number of workmen are exposed. This probably is not true for trades well established about 1900, and continuing to the present. In 1899, 8,751 workers produced 208,466 tons of lead, while in 1925, 6,115 produced 651,000 tons. In 1900 there were 277,541 building trade painters, in 1910, 273,441, and in 1920, only 248,897 (Census Report). Comparable figures for the period covered in this report are not available. From the figures it is reasonable to assert that the actual number of workmen exposed to lead may be less than in either 1900 or 1910, notwithstanding the extension of newer trades, such as automobile storage battery manufacture.

It is upon this type of information, rather than upon any precise and comprehensive records, that claims as to decrease in the number of cases must be predicated. In addition, your committee accepts as contributory factors in the assumed lowered incidence of severe or fatal lead poisoning:

1. Frequent physical examinations of lead workers required by law in some states, and voluntarily introduced by some industries and labor organizations

* Abridged report of the Committee on Lead Poisoning (year ending June 30, 1928), presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

2. The recognition of lead poisoning in its early stages, which permits of treatment under ambulatory conditions, without loss of time from employment

3. The development of improved types of machinery, such as the enclosed electrically heated Mergenthaler linotype

4. The improvement in substitute paint bases, such as lithopone, until they are essentially as acceptable as white lead or other lead compounds

5. Generally better working conditions throughout the lead using industries

6. Shortened exposure periods through shortened work periods

This committee believes that the incidence of lead poisoning is far higher than is commonly believed or reported to state departments of health, compensation boards, etc. One state official expresses the opinion that his records represent not more than 5 per cent of the cases. Of 208 cases reported during the past two years, the majority originated in a few plants which had become much interested in plumbism; only 2 cases among painters were included. In another state, in approximately the same period of time, 54 cases occurred among painters and decorators, notwithstanding the fact that fewer persons were engaged as painters. This assumption of a greater incidence of lead poisoning than reported is further borne out by the special physical examinations of those engaged in hazardous lead work. Such investigations frequently reveal large numbers of mild or obscure cases which otherwise probably would never have been diagnosed. In one plant in Nashville, Leathers and Morgan found that 26 of 39 workers in an enameling plant showed lead poisoning.

This committee believes that the intake of lead in small quantities is widespread among the workers of many lead using industries. This may be followed at no subsequent time by the clinical condition known as lead poisoning. There are some reasons to believe that remote degenerative diseases may be influenced as to time of development and severity by lead in amounts below the threshold of clinical response. In the absence of exact data, we regard the control of limited lead hazards as desirable.

The incidence of lead poisoning has not been so lowered that any negligence on the part of the industrial hygienist is warranted.

INDUSTRIAL COMPENSATION

Only 11 states provide for compensation and medical relief for those exhibiting lead poisoning: New York, Maryland, Illinois, Wisconsin, North Dakota, New Jersey, Massachusetts, Connecticut, Minnesota, Ohio and California.

With few exceptions all states have provided compensation and medical relief for industrial injuries. Although the disability from lead poisoning may be as genuine as that from the more obvious injury,

this, with other occupational diseases, leads to neither compensation nor medical care through direct provision, except in the above mentioned states. In a few states not providing coverage for occupational diseases, lead poisoning has from time to time been held to be an accident, and therefore compensable.

This committee maintains that if the practice of providing compensation and medical relief for industrial injuries is sound, similar measures should be provided for lead poisoning, and for all other characteristic occupational diseases.

SHORTENED WORK PERIODS AND PREFERRED REMUNERATION

It has appeared that some units of organized labor are disposed to base claims for shorter hours and increased remuneration upon the hazards of work. It is argued that if trade processes entail dangers to exposed workmen, the risk will be diminished if a lessened exposure, such as a 5-day week, takes place. Further, since the employer is responsible for, and a shorter work period is necessitated by, the hazard, payment should be made on the basis of a 6-day week.

Where it can be shown that lead, or other occupational exposure, is a factor in shortening the life expectancy of workers, and if the hazards cannot be eliminated, this committee agrees that such unfavorable conditions constitute a just basis for remuneration in excess of that provided for work in which comparable hazards do not exist, and for shortened work periods, if it may be established that these diminish the probability of the characteristic occupational disease or diseases. It is, however, not in sympathy with the use of health hazards as a basis for complaint merely that the economic status may be bettered. The danger is that no demand or effort will be made to eradicate the hazards—rather they will be cherished as leverage for continued economic pressure.

PRESENCE OF LEAD IN EXCRETA OF APPARENTLY NORMAL PERSONS

Extensive work has been directed to the measurement of lead in the urine and feces of persons not known to have been exposed to lead. It appears that traces of lead may regularly be detected in the urine or feces, or both, from apparently normal persons. The source is unknown—it may include food, food containers, lead foil wrappers, cooking utensils, lead flakes from paints.

In view of such findings, this committee suggests that no great diagnostic significance be attached to the detection of lead in urine in qualitative amounts only. Urinalyses appear to be of value in

the diagnosis of lead poisoning only when quantitative, and the quantity found should be in excess of traces common to practically all apparently normal persons.

The Scientific American has pointed out a new hazard in the substitution of lead oxide or lead phosphate for tin in the weighting of silks. It is not yet established that this new hazard extends beyond the textile worker, to the wearers of leaded silk garments, and laundry workers.

Uttal has traced some poisoning to snuff, through the use of lead chromate for coloring, or lead bearing metal foil for wrapping.

McCord has observed lead poisoning in forging machine workers. In punching holes in solid forged rods, the area is coated with white lead. As the hole is punched, hot lead vapor is formed which is inspired by the machine tenders.

Lead poisoning continues to be this country's outstanding occupational disease hazard.

CAREY P. MCCORD, *Chairman*
DOROTHY K. MINSTER
ROBERT KEHOE *

* Dr. Kehoe, owing to his absence from the country, has not seen this report in its present form.

The Health of German Women in Industry

AT the recent annual meeting of the Society of Industrial Hygiene of Germany, it was stated that 40 per cent of the 6 million women gainfully employed in Germany are married. The combined demands of employment, housework, and the care of the children were considered by some of the speakers as having a harmful effect on the women's health. According to statistics of the sick insurance funds of Germany, membership in which is compulsory for all employed women and girls, the sick rate of their women members is on the average 22.5 per cent higher than that of the men members, and the duration of illness is 3 times as long. Particularly unfavorable is the situation in the textile industry. The incidence of illness among gainfully employed women is from 5 to 8 times as great as among those who are not employed. Particularly frequent are diseases of the organs playing an important part in reproduction.

Because of the above facts, the speakers emphasized in the first place the need of more effective legislative protection of employed young people and women, many of whom are mothers of little children, and secondly the need of welfare work with expectant mothers, infants and older children.—*Jugend und Beruf*, Berlin, Jan., 1929, p. 14.

Status of Silicosis*

SILICOSIS, fibrosis of the lungs due to breathing air contaminated by siliceous dust, is found in many industries and in many states. While it has been known for many years by physicians closely associated with the industries causing the disease, the first systematic study in the United States was made in 1914 and 1915 by Lanza and Higgins [1] among the lead and zinc miners of the Joplin, Mo., district. Lanza examined 720 miners, making a limited number of X-ray negatives of the chest. Of those examined, 179 were free of lung disease; 69 were diagnosed as having more fibrosis of the lungs than normal; 330 had silicosis in some stage; 105 had silicosis and tuberculosis; and 39 had tuberculosis uncomplicated.

Harrington and Lanza [2] made a similar study in Butte, Mont. Of 1,018 miners examined, 432 showed definite signs of injury to the lungs due to dust; 194 had early silicosis and 7 were also tuberculous; 1,128 had moderately advanced or second stage silicosis, 8 of whom were also tuberculous; 110 had advanced or third stage silicosis, of whom 48 were tuberculous.

In 1919, the U. S. Public Health Service published [3] a report on the dust conditions in sand blasting and the efficiency of certain protective devices. The respirator tested was of the ordinary muzzle type with a rubber body fitting over the mouth and nose, and an air filter of two layers of 75-mesh muslin and a piece of sponge about $2\frac{1}{2}'' \times 3'' \times 1''$. The average number of dust particles less than $10 \times 20\ \mu$ when aspirated through this respirator was reduced from 49,400,000 to 4,549,000 per cu. ft. This reduction, while great, was not considered adequate. An aproned helmet, made of cloth covered cardboard having a $3'' \times 4\frac{1}{2}''$ window, was tested with a respirator, and with positive pressure both with and without the respirator. The helmet alone, with positive pressure sufficient to produce a current between 2 and 3 cu. ft. per minute, reduced the number of particles from many millions to a few hundred thousand per cu. ft. When a respirator was used with a helmet and positive pressure, a further material reduction resulted. It was recommended that, where workers must be within sand blasting cabinets, they be protected by helmets with positive air pressure and with respirators of the type described.

* Report of the Committee presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

In a study[4] of the dust hazard in an ax-grinding factory, it was found that in Connecticut, 1900 to 1918, the death rate due to tuberculosis was about ten times higher among polishers and grinders than for the male population of the state. Winslow and Greenburg[4] quote many authors who recommend wet methods of grinding for lessening the dust hazard. They conclude that wet grinding, as practiced in the factories studied, is extremely dangerous, and that the substitution of dry grinding with an efficient filtering system, or wet grinding on harder artificial abrasive wheels, is clearly indicated as a measure for protection of workers against respiratory disease.

In 1921 a study similar to that in the Joplin and Butte districts was made by the U. S. Bureau of Mines among gold miners of Nevada. Of 303 miners examined, 51 were negative; 8 doubtful; 141 were in the first stage silicosis; 69 in the second; and 34 in the third stage. Among 181 gold miners of California examined in 1921 and 1922, 68.5 per cent were negative; 24.8 per cent had silicosis in some stage; 6.7 per cent were doubtful; and 4.4 per cent had tuberculosis. No sputum examinations were made, as the cases had progressed to such a stage that the condition could be easily determined clinically.

In a statistical study of the granite industry about Barre, Vt., Hoffman[5] found that during the period under observation the mortality from pulmonary tuberculosis increased from 257.7 per 100,000 in 1896, to 953.4 in 1918 (a maximum of 1,330 having been reached in 1916). During this same period, the mortality of the general population declined from 207.5 in 1896, to 96.4 per 100,000 in 1917, excluding, in the case of the granite workers, the last few months of 1918 on account of the influenza epidemic.

The U. S. Public Health Service has undertaken studies planned to cover the entire field of the dusty trades in the hope of contributing to a better understanding of certain unanswered questions.[6] The following were selected:

1. The cement industry, representing calcium dust
2. Silver polishing, representing metal dust
3. The granite industry, representing silica dust
4. The hard coal industry, representing carbon dust
5. The cotton industry, representing vegetable dust
6. Street sweeping, representing municipal dust

The first of these studies has been completed, and the report published as *Public Health Bulletin No. 176.* The investigation was conducted in one of the older, dustier plants, so that the effect of large quantities of the dust could be observed. Records of all absences from work were kept for 3 years, and the nature of disabling sickness

was ascertained. Physical examinations were made, X-ray films were taken, and the character and amounts of dust in the atmosphere of the plant determined.

The results indicated that the calcium dusts created in manufacturing Portland cement do not predispose workers to tuberculosis nor to pneumonia. The exposed workers experienced, however, an abnormal number of attacks of diseases of the upper respiratory tract, especially colds, acute bronchitis, inflammations of the pharynx and tonsils, and influenza. Attacks serious enough to cause absence for two consecutive working days, or longer, occurred among the men in the dustier departments at a rate about 60 per cent above that for the men in the comparatively non-dusty departments. Limestone dust appeared to be slightly more deleterious than cement dust. Outdoor work in all kinds of weather, such as experienced by the quarry workers, appeared to predispose to diseases of the upper respiratory tract even more than exposure to the calcium dusts.

Of 309 miners of the Tri-State District, Picher, Okla., examined by the U. S. Bureau of Mines in 1923, 101 were negative, 114 doubtful, and 94 positive for silicosis; 52 of the 94 were in the first, 22 in the second, and 20 in the third stage. Following this study, a clinic was established at Picher, the building, heating and lighting being supplied by a local organization. The number that could be examined at the clinic was limited, as only one surgeon was available.

In all the investigations referred to, only a part of the men in any industry were examined. The percentage of those found to have silicosis among the men examined was probably greater than for the total number employed, due to the tendency of those who have symptoms to apply for examination, while the apparently healthy worker does not inconvenience himself to come in.

In addition to the physical examination of miners, surveys of the conditions under which they work, especially as to dust, have been made in most of the studies mentioned. Based on the data collected by the physician and the engineer, the following recommendations are usually made:

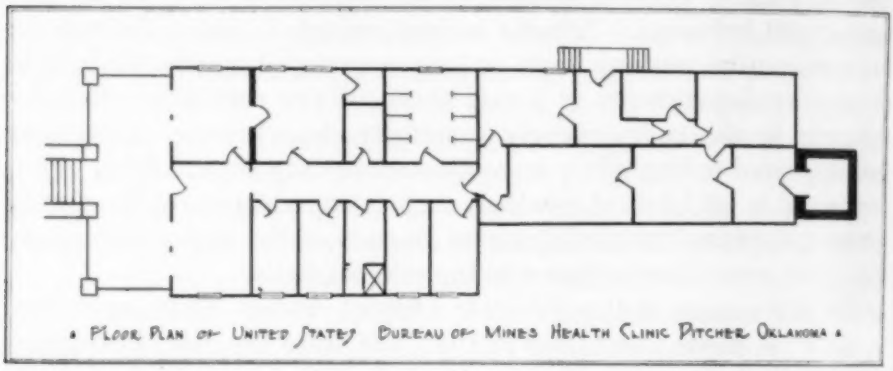
1. That good ventilation be provided to supply air free from dust to all workers.

2. That wet methods be used to lessen the formation of dust and to prevent it entering the air when once formed.

3. Physical examination of all applicants for work in positions where dust exposure exists, with rejection of those having tuberculosis. This rejection is to prevent exposure of healthy workers to the infection, as well as to protect the applicant from any harmful effect from the dust. Periodic examination of all

workers to determine the earliest detectable signs and symptoms of silicosis or tuberculosis should be made.

All men should be informed of the findings and those having tuberculosis removed from exposure to siliceous dust and from contact with others exposed to siliceous dust. Those having simple silicosis should be permitted to make their decisions as to continuing at the work after they are informed of the meaning of the findings.



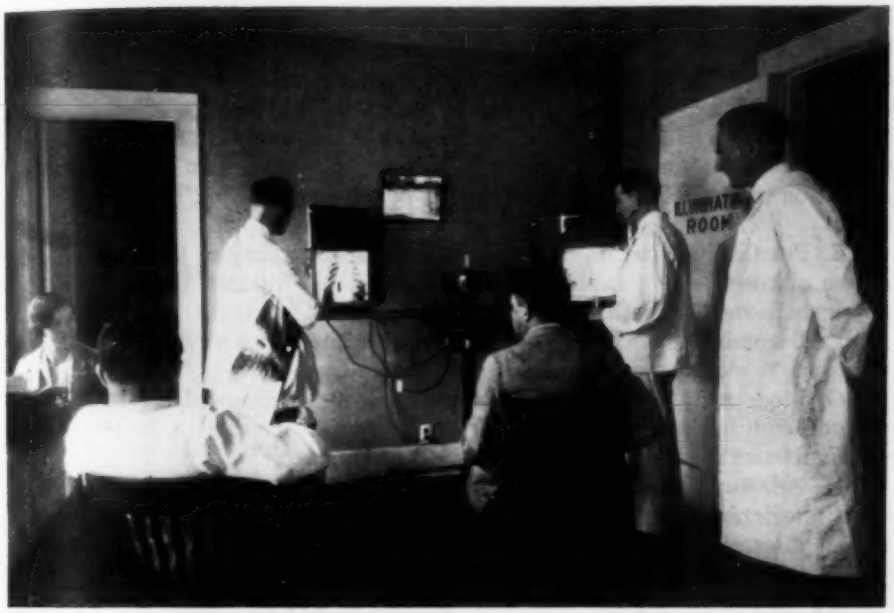
FLOOR PLAN OF UNITED STATES BUREAU OF MINES HEALTH CLINIC PITCHER OKLAHOMA

In the industries in which studies have been made, at least some of the recommendations have been adopted. However, there is no provision for compulsory physical examination of all applicants for work nor for periodic examination of all employees. In 1927, the U. S. Bureau of Mines clinic at Picher, Okla., through coöperation with the Tri-State Zinc and Lead Ore Producers Association and the Metropolitan Life Insurance Company, was enlarged to provide for the examination of all those employed in mining in that district. A special building was constructed, with waiting room, clinical office, four examining rooms, X-ray and developing rooms, X-ray storage vault, dressing rooms, illuminating and conference room, and an office for the physician in charge. In addition, two rooms are provided for the welfare nurses of the district. Figure I shows the floor plan of the clinic.

The personnel of the clinic consists of 4 physicians, an X-ray technician and assistant laboratory technician, chief clerk, 3 stenographers, and janitor.

A standard routine has been developed for examination. On entering the building, a detailed personal and occupational history* is taken. The miner then goes into the dressing room where he undresses and puts on a bathrobe; passes to the X-ray room, where a picture of his chest is made; and then to the photographic room, where

* Copies of the form used may be obtained from U. S. Bureau of Mines clinic, Picher, Okla.



a photograph of his face with his name is made on an identification card (to prevent substitution). He is then given a complete physical examination, special attention being given to the chest, and any defects noted on the history sheet. He next goes to the laboratory for routine blood examinations (Wassermann and Kahn) and, if thought necessary, differential count, stomach analysis, and any additional work desired by the examining physician. The history, containing results of physical examination, laboratory work, and the X-ray pictures, is assembled, read, interpreted, and a diagnosis made. All physical defects are noted and the man given one of the following classifications:

A. Physically sound in so far as can be detected.

B. Average, with such minor defects as slight error in vision or hearing, chronic catarrh, enlarged turbinates and enlarged tonsils, slightly more fibrosis than normal in lungs, large open rings, slight varicose veins, slight varicocele, ingrowing toenails, fat tumors, overweight or underweight, small piles, and such deformities as missing finger, or other deformities that do not interfere with work.

C. Small errors in vision and hearing, very bad teeth, slight rheumatism, silicosis, first degree, moderately bad hemorrhoids or piles (bleeding), moderately bad varicose veins, varicocele, missing fingers, stiff joints (with deformity functioning); certain diseases of the heart, graded C for certain occupations, principally those that will not endanger the man on sudden exertion; also malformations of body that permit of work, as flat feet, beginning goiter, large scars, new growths, psoriasis, eczema, and other diseases that do not seriously interfere with working efficiency or increase the accident hazard, or are not liable to cause sudden death.

D. Seriously defective eyes, hearing, marked rheumatism, deformities, malformations, scars, etc., that seriously interfere with the working capacity; diseases of the heart (liable to cause sudden death), epilepsy, syphilis, gonorrhea, asthenia, very bad varicose veins (with ulcers), cancer in early stages, silicosis, second degree, all contagious diseases, body lice and other vermin, mental defects, and all other diseases considered dangerous to the health of a man employed underground or that will increase the hazard to other men working underground with him.

E. Practically blind or deaf, severe heart lesions (in the last stages), third degree silicosis, severe syphilis, gonorrhea, and all diseases that are liable to terminate in sudden death.

F. Beginning tuberculosis, tuberculosis associated with any of the above diseases, or the closing stage of any of the above diseases.

G. Moderately advanced tuberculosis, moderately advanced tuberculosis complicated with one or more of the diseases previously referred to, or two or more of the diseases previously referred to in advanced stage.

H. Advanced tuberculosis alone or complicated with other diseases.

I. Beginning tuberculosis complicated with silicosis or with some other similar disease that would seriously jeopardize the chances of recovery.

K. Third degree silicosis complicated with advanced tuberculosis.

Men classified A, B, or C are recommended for employment underground, but when those in the C class have certain diseases the card will state "C classification for certain occupations only."

During the fiscal year 1927–1928, the clinic examined 10,427 subjects. The number employed in the mines normally is about 10,000; at present about 7,000 are employed.

E. R. SAYRES, *Chairman*
E. R. HAYHURST
A. J. LANZA

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Establishment of Division of Infant Hygiene in Mexico

A DIVISION of infant hygiene has been established in the Federal Department of Public Health of Mexico. This division will organize infant-hygiene centers, first in Mexico City and later in other parts of the country, for teaching mothers infant care.—*El Universal*, Mexico City, Jan. 22, Feb. 3 & 5, 1929.

Discharge of Filtered Sewage into an Otherwise Unpolluted Stream*

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THE sewage of Brockton, Mass., receives treatment at a plant located in the southwestern part of that city near the line between the city and West Bridgewater. The treatment plant consists of sedimentation tanks, trickling filters and sand filter beds. The effluent is discharged into the Cowesett Brook, which in turn is joined by the Ames Stream, coming in from the west, the two forming the Hockomock River.

The water supply of Brockton is derived from a watershed not tributary to the Hockomock River. It follows that the discharge of sewage effluent into Cowesett Brook increases the natural flow of that stream and of the Hockomock River in proportion to the quantity discharged.

It is claimed by lower riparian farmers that as a result of the discharge of effluent into the stream there is in summer such stimulation of aquatic growths along the banks and in the bed as to retard greatly the combined flow; and, further, that the increase in normal discharge, with the obstruction of the channel, results in the maintenance of such high ground water levels in certain low lands bordering the streams as to render them practically worthless for agricultural purposes.

Action to recover damages was brought in the Superior Court of Plymouth County by a group of riparian owners. An auditor was appointed by the court, who heard the evidence and made a view of the Brockton sewage works, streams and lands involved. The report of this auditor was presented recently to the court, and a review of the case is of considerable interest from the standpoint of the sanitary engineer.

Below the junction of the Ames Stream and the Cowesett Brook, the Hockomock River flows in a general southerly direction for several miles, then turns east to form, with Nippenicket Brook, the Town

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

River, which flows east, then south, until it joins the Taunton River, which in turn empties into Narragansett Bay. The upper portion of the watershed above West Bridgewater is gently rolling farm land upon which are scattered several small villages, none of which is supplied with a sewerage system. Along the lower course of the Hockomock and in the vicinity of the Nippenicket Pond, from which the Nippenicket Brook flows, there is an extensive area of low land known as Great Cedar Swamp. The watershed areas of the several streams above certain significant points have been determined from the U. S. Geological Survey maps as follows:

Cowesett Brook at confluence with Ames Stream, 7.9 square miles
Ames Stream at confluence with Cowesett Brook, 9.6 square miles
Hockomock River at West Center Street, 20.1 square miles
Town River at Ames Dam, 52.8 square miles

HISTORY OF THE USES OF THE HOCKOMOCK RIVER

For many years the Ames Stream and Cowesett Brook have been used as sources of water power, and dams and mills have been constructed upon them. The milldams on the Cowesett Brook have ceased to function as such, but the small ponds formed thereby are used for ice harvesting. The Ames Stream is still used to some extent for water power. In the Town of Easton, the Ames Agricultural Implement Company maintains a small shovel mill operated by water power, which has been in existence for many years. The water of this stream is again used for power at three different points. Below the Ames Company two other water powers are utilized during four or five months of the year. No milldam or pond occurs below the junction of the Ames Stream and the Cowesett Brook until the Village of West Bridgewater is reached, about 10 miles downstream, where there is an old dam called the Ames Dam, located across the Town River.

The stream and its tributaries have been used for water power for many years and the flow controlled according to such use, this being by riparian owners and within their rights. The utilization of the streams for power is of significance in connection with the claims and counterclaims during the legal proceedings described later.

Brockton Sewage Treatment Plant—In 1893, the city of Brockton began the construction of a sewerage system and in 1894 a sewage treatment plant consisting of intermittent sand filters was built. These were located in the extreme southwest corner of the city and the effluent discharged into Cowesett Brook. The present plant consists in part of the original filters, with sedimentation tanks and trickling filters constructed during the past 16 years.

The sewage flows at Brockton have in general steadily increased from about ⅓ m.g.d. in 1896 to over 3½ m.g.d. in 1927. This fact is of particular significance as regards the changes in the character of Cowesett Brook and Hockomock River by the discharge of sewage effluents.

Effect of Discharge of Brockton Sewage Effluent—The first effect of the discharge of the effluent is to increase the normal flow of the streams into which it enters. In winter, this is materially less in proportion than in summer, due to the greater natural run-off. The effect is proportionately less in a wet than in a dry year. The proportions of effluent in the Cowesett Brook below the treatment plant for the months of July to October, inclusive, 1923, computed on the basis of data presented during the hearings, are given in Table I.

TABLE I

PER CENT INCREASE IN NORMAL STREAM FLOW DUE TO DISCHARGE OF BROCKTON SEWAGE EFFLUENT

1923 Month	Sewage Flow	Normal Stream Flow Cowesett Sta. 4	Normal Stream Flow Hockomock Sta. 5	Per Cent Increase due to Sewage Effluent at Sta. 4	Per Cent Increase due to Sewage Effluent at Sta. 5
	c.f.s.	c.f.s.	c.f.s.		
July	3.92	2.22	9.78	177	40
August	3.18	1.56	7.89	204	42
Sept.	3.11	0.75	5.43	415	57
Oct.	3.02	2.29	9.98	132	30

It will be seen that in the summer of 1923 a large proportion of the average monthly flows of Cowesett Brook and Hockomock River consisted of effluent from the Brockton plant.

One of the most serious effects of effluent, as claimed by the plaintiffs, is the stimulation of aquatic growths and the resultant clogging of the channels by the growths and by banks of silt and sand, the formation of which is fostered by these growths. Plant growths are stimulated by nitrogen in the form of nitrates and by carbon dioxide, both of which are present in considerable quantity in sewage effluents. The very heavy growth of vegetation in the Hockomock River below the plant at Brockton aggravates materially the effect of the augmented stream flows.

The combination, therefore, of channel obstruction with abnormal flow during the summer months results in the maintenance of high water levels in the stream and high ground water levels in the low lands along the stream so that it is impossible to secure proper drainage of these lands. Much of the land adjacent to the stream is subject to flooding under normal conditions in winter and spring, but in summer in earlier years has been cultivated and crops grown thereon.

Another effect of the discharge of sewage effluent has been to change the physical appearance of the stream as regards color and turbidity. In the early days of operation of the intermittent sand filters, the effluent was practically clear and colorless and had little effect upon the stream into which it was discharged. As these filters became inadequate to care for the entire sewage flow, trickling filters were built, part of whose effluent after sedimentation was discharged directly into the stream, and part upon sand beds. The turbid character of that part of the effluent not passed through the sand beds brought about an increase in turbidity and color in the stream receiving it. Above the entrance of the sewage effluent, the stream is ordinarily clear, with a slight natural brown color, and odorless. Below, the stream became gray or gray-brown in color, turbid, and at times slightly odorous. The character of the stream bottom changed from clean sand or gravel to black humus-like material, and at times masses of worms similar to those found in trickling filter media were noted.

Analyses have shown a marked increase in organic constituents and in bacterial content in the stream waters below the treatment plant. The organic matter has been sufficient in summer to bring about a marked reduction in the dissolved oxygen content of the stream. Such reduction, however, has not been sufficient to bring about putrefactive conditions of the stream water. Offensive conditions, however, have been caused, due to the stimulation of large growths of duckweed which at times have collected in masses, died and decayed, with the production of offensive odors.

Hearings before Auditor—During the hearings, which consumed about 20 days, much evidence, both technical and lay, was presented by plaintiffs and defendants. Some of this is summarized in the following paragraphs:

The sewerage system and method of sewage disposal adopted by Brockton were authorized by an Act of the Massachusetts Legislature in 1890.* Section 2 of this Act referring to the Board of Commissioners of sewerage construction authorized by the Act reads in part: "said Board of Commissioners shall have exclusive authority to construct, maintain and operate the system of sewerage and of sewage disposal adopted by the City Council. . . ."

On May 28, 1890, the City Council of Brockton adopted a system of sewage disposal in an order reading as follows: "Ordered, that a system of sewerage be, and the same is hereby adopted for the whole territory of the City of Brockton, with mains, pumping stations and

* Chapter 248 of the Acts and Resolves of 1890 of the Massachusetts General Court.

irrigation lands, as may be necessary to successfully operate a system of sewage disposal by 'downward filtration,' which system of sewage disposal is also hereby adopted."

This order, and particularly the description of the system of sewage disposal as "downward filtration," assumed some importance in the course of the case. It was claimed by the plaintiffs that the trickling filters did not comply with the original plan and scheme adopted and authorized by the city council. No record of the adoption of any other method of disposal was produced by the city. The plaintiffs' contention that there was a departure from the original plan and scheme was based upon the interpretation that in 1890 the term "downward filtration" referred to intermittent sand filtration, that trickling filters had not been devised at that time and being a subsequent invention could not have been the method of sewage disposal then adopted. The defense claimed that "downward filtration" was a general term applicable to any kind of filtration, trickling filters or intermittent sand filters. The plaintiffs in turn pointed out that in the records of the original order the term "downward filtration" was set off by quotation marks, showing that a specific kind of filtration was meant and that the intermittent sand filters installed were in compliance with the meaning of the order. The contention of the plaintiffs in this matter was upheld by the auditor in his report.

It was brought out that in time the original filter beds became overtaxed, resulting in a deterioration in the quality of the effluent. Due to the inadequacy of available areas for extension of the sand beds, it became necessary to adopt a different system of treatment. After studies and experiments trickling filters with preliminary and secondary sedimentation tanks were adopted by the sewage commission but without formal adoption by the city council.

From the correspondence passing between the city authorities and the State Health Department, it appeared evident that treatment of the final effluent from the trickling filters upon the old sand beds was contemplated. As a matter of fact, certain of the sand beds were set aside for this purpose but, as was brought out in the testimony, only a portion of the trickling filter effluent was thus treated, although steps were under way to make available more sand bed area so that the entire trickling filter effluent could be treated thereon. The auditor found that if the trickling filter effluent were passed through the sand beds, the city would be treating the sewage in accordance with the original method adopted by the city council in 1890 but that it failed to treat according to the method adopted when trickling filter effluent was discharged directly into the stream.

Evidence was given to the effect that stimulation of aquatic growths would occur whether trickling filter effluent or sand bed effluent were discharged, and that good sand bed effluent might result in even greater stimulation of growths due to its more highly nitrified character.

The defense claimed that the regulation of the Ames Stream for power purposes was an important factor in the maintenance of high water levels in the Hockomock River but presented as evidence a maximum observed effect of only about 6 inches at the property of the owner of the largest areas involved. As power regulation had existed for many years, the contention that it was a material factor apparently received little attention on the part of the auditor.

It was difficult to estimate the rise in water levels as a result of the obstruction by excessive aquatic growths. This difficulty was due in part to the fact that no hydraulic study of the stream had been made prior to the time it became affected by the vegetation. Furthermore, the course of the stream is meandering and its cross-section varies materially from point to point, making hydraulic measurements of doubtful significance. Based on judgment and a few actual measurements, it was estimated by the engineers for the plaintiff that the normal water level in the stream during the summer months had been increased from 1½ ft. to 2 ft. by the excessive vegetation in the stream. This estimate was accepted by the auditor, who found that the land involved had been rendered worthless as a result of the increase in water levels resulting directly and indirectly from the discharge of the effluent from the Brockton sewage treatment works. The several plaintiffs were awarded damages amounting to the fair market value of their lands as of 1914 together with interest from the date of the writ.

CONCLUSION

This case is illuminating as to the results which may follow the discharge of effluents from sewage treatment plants into streams where the natural flow available for dilution compared with the volume of effluent is small. Two lessons are taught: (1) Well purified effluents require substantial dilution. (2) Extensive easements may be necessary where adequate dilution is not available.

Steps in Planning a Health Education and Publicity Program*

The Facts—How to Decide What Is to Be Told

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IT IS my special function to discuss the factual material to be used in this campaign, to suggest criterions by which we may select the particular things which we wish to tell the world. This is, after all, a somewhat important consideration if publicity is a means and not an end in itself. The points we select should be true, important, comprehensible, acceptable, and usable.

First, our facts should be facts. All truth is relative, but we can at least strive to escape the cruder errors of the past. We can avoid giving the impression that litter and paper in the street and in the back yards are likely to produce disease; that dust is a fertile source of infection; that dental caries bears an inverse relation to the use of the tooth brush twice a day. On the other hand, we should not be too eager to introduce into our programs of popular education the newest suggestions of science before they have become established and accepted. We should be careful about advocating the indiscriminate use of iodized water or salt, or of scarlet fever serum as preventives. We should be cautious as to our statements regarding the relation between neglected tonsils and infections of the heart. These, and many more things which are interesting us at present, may prove to be true; but only after thorough thrashing out of all opposing scientific points of view should we shout the conclusions of science into the public ear. As Polonius tells us—" Be not the first by whom the new is tried, nor yet the last to cast the old aside."

In the second place our facts should be important. The statement of even an unquestioned truth with over-emphasis may often prove misleading if we do not bear in mind the relative proportion of different truths and their probable effect upon the public mind. It

* Papers from a symposium of the Public Health Education Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17 and 18, 1928. Papers by Mary Swain Routzahn, Howard Whipple Green, and Marjorie Delavan appeared in May, 1929, Journal.

is true that clean milk is better than dirty milk and for children it is probably more healthful. It is probably true that tuberculin testing of cattle is a useful mode of protecting these animals against one of their commonest and most serious diseases. It is not, however, true that clean milk from tuberculin tested herds is necessarily or probably safe milk for human consumption. There is only one safe milk—that which has been made safe by heating. This is the important fact for the public to know and, if emphasis on the other and lesser facts obscures this one, we are doing harm and not good.

In our program of public health education as a whole we may properly ask for something even more than accuracy of emphasis in regard to each particular problem. We may also demand that each problem emphasized be set into a general scheme which will make for a comprehension on the part of the public of the broad and fundamental principles which underlie the promotion of health and the prevention of disease. There are, I believe, some dozen such principles which we should like every member of the community to grasp, and we may properly consider how each element in our educational plan contributes toward building up these basic attitudes.

We must, for example, make sure that our educational program as a whole tends to further an understanding of the established elements in personal hygiene. We want our public to understand the importance of diet as a basis of sound health, an importance which we are realizing more and more fully with every passing year. There are few things which would accomplish more for health promotion than an increase in the consumption of milk, fruits and green vegetables; and the change in the dietary habits of a whole population, accomplished at Fargo as a result of well planned health education in schools, is one of the most significant accomplishments of recent years. We want our public to understand the rôle of cool, moving air as a factor in the hygiene of the skin and as an important element in promoting resistance against respiratory infections. We must emphasize the value of exercise and the hygienic significance of sleep and rest. We must keep in view the novel, and as yet only half understood, principles of mental hygiene. In this field we are not only missing invaluable opportunities, but we are often perhaps doing positive harm. I once saw a poster representing a foreman administering to the worker with a large spoon "His daily dose of lead." Such a poster tends to create mental disease more than to control industrial poisoning.

Our main objectives should also look toward a comprehension of the ways in which communicable diseases are spread and in which they may be controlled by the protection of water and food supplies, the

elimination of insect carriers of disease by isolation and quarantine, and by such habits of personal cleanliness as tend to guard the gateway of the mouth. Above all, we must work for a real comprehension on the part of the public of the principles of vaccine and serum therapy.

Still another set of principles which should be basic are those which deal with the relation between the physician and the patient. We should do everything that we can to build up the idea that the physician is a trainer and not a repair man, and to show how, from the prenatal period through infancy and school life, in industry and in the decades of degenerative disease, the principle of health examination is essential to a maximum of health and efficiency.

Everything that we include in our health education program should consciously lead toward the building up of a knowledge of principles of healthy living, and this program should be so organized as to cover them all with reasonable completeness in any period of a year.

In the third place, the facts we teach should be comprehensible to the man in the street, and not merely to the statistician, physician, or sanitarian. Statistics addressed to the general public should be simple and obvious in their bearing. Lists of the number of cases of communicable disease occurring in a city or state during a given week have a charm which is beyond my personal comprehension, but which is clearly indicated by the eagerness with which newspapers give space to bulletins of this sort. From the public health standpoint, they are almost meaningless, but they apparently appeal to the average reader like the box score of a baseball game. They give the impression that something is happening. They form current news. On the other hand, proportions and averages mean little or nothing to the average reader. When one reads, as in a recent city bulletin, " . . . about 3 out of every 5 children less than 6 years old can catch diphtheria, and about 2 out of every 5 children between 6 and 10 years of age can catch this disease," the average reader with a 13-year mentality is absolutely " sunk." Specific individual cases with the human appeal carry far more effectively than most statistics, and many visiting nurse associations are obtaining splendid health publicity with data of this kind. In general, our material should be simple and concrete, and our programs so planned that one lesson at a time may be hammered in, before the public mind is confused with some different and perhaps conflicting issue.

The fourth of our criterions is, that the facts we select for our educational program should be emotionally acceptable. If we are to accomplish results, it is essential not only to catch the interest of the hearer but to arouse in him a desire to attain the aim set forth.

There must be motivation as well as intellectual conviction. In considering this aspect of the problem we should lean more heavily than we have done upon the psychologists and professional educators.

Finally, as our last criterion, it is perhaps scarcely necessary to emphasize that the facts which we teach should be usable. In dietary instructions it is not of particular value to urge the drinking of milk in a southern industrial community if no milk can be obtained. It is futile to advertise toxin-antitoxin treatment of children unless there are clinics where the treatment can be administered. It is useless to urge an adult to go to his physician for a health examination, unless there is some reasonable probability that when he goes he will get one.

SUMMARY

The object of our whole program is, I take it, to change the conduct of individual men, women and children. We want them to manage their bodies well; to help us check communicable disease; to use preventive medical service; and to support the community program of health promotion. In the factory, it is possible to analyze every industrial operation into the simple exposure form of a raw material to a tool or a process with the production of a finished product. Our raw material is ignorant human nature; our finished product is the citizen trained in healthy living. Our tools are our bulletins, newspaper articles, lectures, radio talks, and cinema showings. The facts that they teach must be true and important or the educational process will not be worth the cost. They must be comprehensible, acceptable, and usable, or there will be no effective educational process at all.

We are interpreters between the vast resources of health science on the one hand and the individual in the home and the factory on the other. We must keep both things in view. We must believe in both. We must have faith in the message we deliver. As Richard Cabot once said, I think, of social service, we must feel that we have something "too hot to hold." We must also believe in the educability of the common man, or our efforts will be spiritless and futile. It is these two faiths after all—faith in the cause, and faith in human nature—which make the health educator. Whatever our technic, whatever our rigidness of self criticism, we must add at the end that quality of enthusiasm—a word which in its derivative sense means an inward god. The work of translating the lessons of science into human conduct is indeed a godlike one. If we fully realize its significance, we shall not fail.

The Approach—How to Decide on the Motives for Conduct to Which an Appeal Will be Made

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BROADLY speaking, there are but two fundamental questions which may be asked regarding human behavior: *How* do individuals act as they do—what are the mechanisms and processes involved in behavior? and *why* do people act as they do? It is with the latter question that we are primarily concerned in the present discussion. Attempts to answer this question have been made since man first speculated regarding the origin and causes of his own acts. A completely satisfactory answer would imply the ability to predict individual action on the one hand, and the ability to control or modify it on the other. We must confess that such an answer is not forthcoming in the present state of our knowledge; the claims of the pseudo- or itinerant-psychologist, the phrenologist, and the quackish fraternity in general to the contrary notwithstanding. While the advance which modern psychology has made in this field does not enable us to manipulate individual action with certainty, it offers data which are suggestive to those who are concerned with problems of direction and control of public opinion, and the modification of individual action.

What is the nature of those inner or outer factors which determine and control our behavior in given situations? Why, for example, do I turn my head toward the source of a sudden loud sound, stop my automobile when the traffic light flashes red, stand up when the national anthem is played, vote for a particular presidential candidate, or read a paper before a scientific association? The blanket term "motives" may be applied to all those factors or mechanisms in the organism which determine my response in these or other situations. A motivated response, then, is one which is determined primarily by conditions or factors within the organism. Knowledge of the nature of these factors is of the greatest significance to all those interested in the modes of effective appeal with a view to modifying human action.

There have been those who would say that these inner factors or motives are primarily rational and logical in nature. It is assumed that man is possessed of nicely tied-up packages of knowledge, called ideas, as a result of experience in the world, and after a preliminary

period during which these ideas are compared and arranged, reasoned and logically determined actions result. Furthermore, it is assumed that some of these ideas carry with them a kind of inherent rightness or soundness—as though they were certified checks—which will be instantly recognized by all reasonable and right thinking persons, and hence will lead to sound judgments and reasonable behavior. I am, for example, presented with a leaflet on which is emblazoned the statement that "Heart disease, after age 40, heads the list of causes of death in the United States," with the accompanying suggestion that death from this disease can be reduced by early diagnosis and treatment. As a bit of presumably authoritative information, this statement is interesting, but it carries no guarantee that it will stimulate rational thought which will lead to desirable action in the form of periodic physical examinations. At best it will arouse a mildly disturbing fear reaction.

The conception of human action as motivated by conscious rational processes presents an artificial and unreal picture of behavior. It is true that we rationalize our behavior after the acts have taken place. It is true also that in certain restricted fields, for example, science, rational processes probably occur before action. But it is one of the most certain conclusions of modern scientific psychology that in the vast majority of our actions there is little in the way of preparation that may be included under such terms as reasoning, judging or thinking. A publicity program based exclusively on the assumption of rational motivation in human action cannot be expected in the long run to yield satisfactory results.

A second assumption regarding the controlling factors in action is that the organism responds in a more or less mechanical way to external stimuli. From the point of view of this conception the "right" stimuli will inevitably release the "right" responses. For example, correct information or positive instruction regarding prevention of disease is expected to lead to positive and desirable action. This will not occur unless the information or instruction is arranged to appeal to motivating factors within the individuals to whom the appeal is directed.

It is with the nature of these motivating factors that we are concerned in organizing and presenting publicity material which is designed to modify human action. My reaction to the names Herbert Hoover or Alfred E. Smith or Norman Thomas is not explained by those words as merely auditory or visual stimuli, or even by the purely intellectual considerations of what I am told is their position on the tariff question. My reaction, in so far as it has drive and intensity,

is determined by the appeal which those names, as symbols, make to certain fundamental, non-rational reaction patterns or tendencies to action. These reaction patterns or mental sets, many of which were acquired in childhood, furnish a background and are the source of the drive for most of the activities of the individual. Some of these may be inherited, but most of them are acquired by a process of social conditioning. They are called attitudes and may be defined as the more or less persistent tendencies by reason of which the individual is rendered particularly susceptible to certain kinds of situations.

I may have, for example, a strong attitude regarding animal pets —dogs in particular—which will determine in large measure whether I shall enthusiastically support or resist an attempt to enforce a measure to muzzle dogs in an antirabies campaign. It may be that my somewhat undiscriminating affection for dogs will cause me to view the entire campaign in the light of an unwarranted persecution of these animals. This may lead to an active resistance to all attempts to muzzle my own dog and an attempt to organize public sentiment against the measure itself. On the other hand, a deep-seated fear of dogs may cause me to see a mad dog in every panting animal met in the street. These attitudes may have existed over a long period of time and possess an intense emotional coloring, or they may have been established by a single recent experience. For example, the sight of a dog chasing a child, or an instance of a neighbor's child being bitten, or the report of my own child that he has been attacked by a dog, may serve to set up an attitude which will determine my response to any type of stimulus which relates to dogs. In these instances we have action determined by processes in which reason and logic play little part.

Attitudes of a more general type are illustrated by one's reaction to such topics as immigration, prohibition, socialism, Bolshevism, etc. In these cases the attitudes are released or " touched off " by a wide range of stimulating situations. Our attitude toward Bolshevism, for example, may determine our behavior toward Russian art, the Russian ballet, Lenin, whiskers and Tolstoi.

A striking characteristic of attitudes of the latter type is the facility with which they become attached to symbols. These symbols, or stereotypes, as they are called, are illustrated by our conception of a bewhiskered Bolshevist throwing a bomb, the absent minded college professor, the excessively collegiate college student, the long haired poet, the excitable Frenchman, the phlegmatic Britisher, and so on. These stereotypes frequently symbolize our attitudes toward certain individuals, groups, or races, or they may represent our atti-

period during which these ideas are compared and arranged, reasoned and logically determined actions result. Furthermore, it is assumed that some of these ideas carry with them a kind of inherent rightness or soundness—as though they were certified checks—which will be instantly recognized by all reasonable and right thinking persons, and hence will lead to sound judgments and reasonable behavior. I am, for example, presented with a leaflet on which is emblazoned the statement that "Heart disease, after age 40, heads the list of causes of death in the United States," with the accompanying suggestion that death from this disease can be reduced by early diagnosis and treatment. As a bit of presumably authoritative information, this statement is interesting, but it carries no guarantee that it will stimulate rational thought which will lead to desirable action in the form of periodic physical examinations. At best it will arouse a mildly disturbing fear reaction.

The conception of human action as motivated by conscious rational processes presents an artificial and unreal picture of behavior. It is true that we rationalize our behavior after the acts have taken place. It is true also that in certain restricted fields, for example, science, rational processes probably occur before action. But it is one of the most certain conclusions of modern scientific psychology that in the vast majority of our actions there is little in the way of preparation that may be included under such terms as reasoning, judging or thinking. A publicity program based exclusively on the assumption of rational motivation in human action cannot be expected in the long run to yield satisfactory results.

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tude toward an idea or principle. They are of the greatest significance to those who are concerned with the control or modification of individual action for the reason that by means of pictures or in other ways, it is possible to appeal to the attitudes of the individual through his stereotypes.

This appeal is possible because, to a large extent, the stereotypes which the individual holds determine the nature of the impressions which he gets from the world about him. My stereotype of the Englishman expresses my antagonism and hatred, or my affection and respect; in either case it acts as a selective factor so far as my impressions of Englishmen are concerned. These stereotypes may be formed as a result of a slow accretion of impressions over a long period of time, or they may be formed as a result of systematic propaganda. When they represent the collective attitudes of a group, they may compel the object of the stereotype to conform to the picture. For example, the American stereotype of the youthful aviation hero compelled its object, Lindbergh, to conform or "fit into" the picture. The creation of these stereotypes is one of the great games of the publicity agent, as a result of whose activity we may have the "strong silent man in the White House," the "people's friend," the "great humanitarian," and the "happy warrior."

We may briefly summarize the characteristics of attitudes and point out their significance to those who are trying to modify the conduct of men, women and children. Attitudes as factors in human action may be characterized as follows:

1. *They tend always to express themselves in action.* They are potential actions. In fact, they may be said to exist only in so far as they do obtain overt expression. The individual from one point of view may be regarded as constantly seeking situations in which these attitudes may find satisfying expression.

2. *Attitudes tend to have a strong emotional coloring.* They have their roots in our likes and dislikes, our fears, hates, and joys.

3. *Attitudes do not involve rational processes as an antecedent to action.* Deliberative action involves a balancing of the issues and tends to inhibit or at least retard action. Actions which involve major attitudes tend to be immediate and intense.

4. *Attitudes may be conscious or unconscious.* That is to say, I may recognize and identify my attitude or I may fail or refuse to recognize that my actions are motivated by a particular attitude.

5. *Attitudes are associated with and easily released by symbols, signs, slogans, phrases, catch-words and pictures.* The individual tends to build up a stereotype or mental picture in which the attitude is personalized and characterized in graphic form. Newspaper cartoons make large use of this mechanism in appealing to group attitudes. Slogans almost always appeal to attitudes. Whoever stops to analyze intellectually a slogan? It is what the slogan implies or suggests that makes it effective.

6. *Where fundamental attitudes are involved, the response is out of proportion to the intensity of the stimulus.* The wild enthusiasm incited by the appearance of a brown derby can scarcely be accounted for in terms of the brown derby as a visual stimulus.

7. *Attitudes may be developed as a result of a single experience, or they may be established by systematic and persistent propaganda.* An example of the first is the establishment of an intensely negative attitude toward a given race as a result of a single unpleasant experience with a representative of that race. In the second case my attitude towards public health may be established as a result of the continuous presentation of materials arranged in dramatic and dynamic settings, suggesting success, prestige, happiness and efficiency.

The significance of attitudes to those interested in a program of health education is obvious. The objective of such a program is the modification of conduct of men, women and children with regard to what might be termed "health behavior." Such a change in conduct cannot be effected except through a change in attitudes.

We may apply the term propaganda to the technics involved in bringing about such a change. Propaganda has been defined as "the manipulation of attitudes by means of significant symbols," and has for its object the arousal of action in specific situations. The most effective modes of propaganda appeal are those which refer to established stereotypes. These take graphic form in pictures and symbols or the written form in slogans. There must always be a certainty that there is some relevancy, i.e., some assumed causal connection between the picture, symbol or slogan and the attitude or stereotype to which the appeal is made. The public health behavior which it is your purpose to establish must be demonstrated in dramatic form, and presented in settings which connect it with the stereotypes and symbols, for example, of success, power and prestige. From the psychological point of view, the function of propaganda and publicity organizations may be generalized as follows: they are concerned with the development of tendencies to action, i.e., attitudes, by the manipulation of significant stereotypes, and the arrangement of satisfying situations which permit the completion of actions thus initiated.

Propaganda campaigns may be divided into three classes:

1. *The campaign may be directed toward already existing attitudes.* Known attitudes of the group regarding childhood, old age, and personal hygiene may be made the object of appeal. The technic in this case consists in associating already established attitudes with new situations. One of the characteristics of human nature is the tendency to infer a causal connection between events or situations experienced together. If Mrs. Astor-Vanderbilt permits her picture to be used in the advertising of a certain cosmetic, the attributes of success and prestige which are attached to Mrs. Astor-Vanderbilt become attached in our minds to the cosmetic in question.

2. *The objective may be the establishment of new attitudes.* Individuals who are neutral or indifferent are usually individuals who have no attitude with regard to the appeals which are made. A basis for the attitudes to be established should be laid in the form of an educational or informational campaign. But such information and education is futile unless it is eventually made the basis for action, that is, unless attitudes are established with regard to it. Not merely authoritative information, sound health instruction, accurate vital statistics, but dynamic, dramatic and systematic propaganda is necessary.

3. *Opposing attitudes must be overcome.* This is the justly famous "sales resistance." In general the technic in this case consists in avoiding rather than antagonizing the resisting attitudes of the groups appealed to.

All propaganda agencies make some assumptions regarding the psychological make-up of the constituency toward whom their appeals are directed. A fundamental problem has to do with the nature and kind of fundamental attitudes which may be assumed to be present in the beginning. Just what are our fundamental attitudes? Here it is necessary to proceed with the greatest caution. Assumptions in this connection based upon armchair speculation are very easy. It is necessary to be realistic about the matter rather than indulge in sentimental assumptions regarding the essential goodness of human nature. Is there a realistic basis for the assumption of fundamental attitudes regarding kindness to animals, affection for children, love of home, desire to be healthy, desire for and interest in good citizenship? As a matter of fact we do not have generalized attitudes regarding these matters, but specific attitudes regarding specific situations, events or people. A detailed analysis of the fundamental attitudes to which public health propaganda should be directed must be based upon careful research to determine the nature of the attitudes regarding public health held by the majority of individuals. Investigation of the results of specific types of response to public health propaganda, together with the study of group attitudes already existing, is absolutely essential to the development of an intelligent and realistic program of public health education. Until research of this type is undertaken, propaganda will be upon a trial and error basis; some of it will succeed, much of it will fail.

There is one fundamental attitude which is sufficiently common to warrant mention. It may be termed the prestige motif in the individual. It is variously called the desire for success, power, domination, or place. It is the attitude toward which much of the most skillful advertising of our day is directed. Why do we wish to avoid halitosis, buy tooth brushes, Life Buoy soap or expensive motor cars? There seems to be a fundamental drive to appear well in the eyes of our fellows, to make a good impression, to be appreciated.

The same appeal and the same attitude which results in the sale of vast quantities of Listerine might be successful in obtaining periodic health examinations. The fundamental features of the American stereotype are embodied in the terms success, domination, efficiency, power, size. The appeal of the beggar on the street and the wistful waif of the Community Chest campaign literature is effective not because they arouse alleged sentiments of generosity or pity for the helpless, but because these figures represent a distressful negation of success, efficiency and power. In a sense, these symbols are effective because they appeal to our desire to escape from that which is unpleasant. If public health programs can be linked with efficiency and success stereotypes, experience has demonstrated that a measure of success is certain.

Examination of public health propaganda literature reveals the fact that the most frequent appeal is to fear attitudes. This may be occasionally warranted, but in the long run it is dangerous, inimical to mental health, and may lay the foundation for the development of specific mental disorders. It may be ineffective also, since we are much more concerned about the state of our prestige than we are fearful regarding the state of our hearts or lungs.

The methods herein described do not depend for their efficacy upon the ultimate soundness or truth of the facts or principles in the interest of which the campaign is conducted. The guaranty that those facts and principles of public health possess a degree of scientific certainty is the only justification for the use of the methods described. The absence of that guaranty reduces public health education to the level of a campaign for the sale of cigarettes.

As a psychologist rather than a public propagandist, I should seriously consider the proposal to conduct a campaign to immunize the public against all campaigns. One of the modes of establishing such immunity would be to establish a vigorous critical attitude in all people regarding the essential validity and the actual realities represented by the campaign hokum, stereotypes, mythological figures and slogans established as a result of high powered publicity. Is the man in the White House really strong and silent? Does the Brown Derby conceal a real democrat? Is there valid statistical proof that a toothbrush drill in schools really reduces the frequency of teeth defects in adults? When the public discovers that there is no fundamental reality to the illusions and stereotypes created by propaganda, an anti-campaign attitude will be set up which will mean the ultimate elimination of all educational propaganda. Therein lies a warning—a warning which, perhaps, it is not the function of the psychologist to voice.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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THE WORM TURNS

THE old slogan, " It Pays to Advertise," seems to need some slight revision. For two or three years past, we have been afflicted by cigarette advertisements which were preposterous on the face of them, many accompanied by photographs of movie actors and actresses, baseball and football players, heroes, and—most disgusting of all—a well known Army officer. One brand or the other, as the case may be, wins elections, prize fights, makes statesmen, educators, musicians, or anything else which may seem desirable at the moment. The sad part is that these claims, ridiculous as they are, seem to sell the goods, and at least one company boasts constantly of the increase in cigarette consumption, presumably due to its particular alleged method of treating the tobacco.

The world has at last turned. Naturally the different companies have resented some of the advertisements. There have been movements against the sale of certain brands in restaurants and other public places where sweets are also sold. The candy and sugar manufacturers generally have naturally taken the opposite side, and are pushing their wares, up to the present in an ethical and truthful manner. A number of organizations of national scope, as well as clergymen, physical educators, and welfare agencies, have taken up the fight against the wholesale advertising of cigarettes.

The radio furnishes a means of reaching easily many people; so it is only natural that its services have been enlisted. The most recent movement is a petition to the Federal Radio Commission for the revocation of the licenses of 38 radio stations, located from the extreme North to the extreme South, and from the Atlantic to the Pacific. The petition is based on the grounds that the programs of

a particular tobacco company which are being broadcast are "contrary to public interests, convenience or necessity"; that the object of the advertisement is to transform 20 million growing boys and girls into cigarette addicts; that cigarettes are advised as a substitute for wholesome foods; and harmful diet fads are being encouraged at the expense of health.

Just as the brewers and distillers went to extremes which led to their downfall, so it seems that some cigarette manufacturers are exceeding the bounds of reason and common sense. Whatever differences of opinion there may be as to the use of tobacco by adults, it is universally conceded that its use by adolescents is harmful. The excessive use of cigarettes, combined with the lessening of the appetite and the avoidance of foods which furnish heat and energy, has probably played its part in the increase of tuberculosis noted among young women during the last few years, attention to which has been noted by certain boards of health and statisticians.

PUBLICITY FOR PUBLIC HEALTH

LOUIS E. Schmidt, M.D., Professor of Urology at Northwestern University, Senior Urologist at St. Luke's Hospital, Chicago, Fellow of the American College of Surgeons, Vice-President of the American Public Health Association, just elected member of the Board of Directors of the American Social Hygiene Association, member of leading medical societies in his specialty in this country and abroad, has been expelled from membership by the Chicago Medical Society for "unethical" conduct. The case has attracted national attention in the daily press and in lay and professional magazines, the spur of popular interest being the impression that the action of the medical society was a move against efforts to reduce the cost of medical care.

This is not the place to enter into the merits of the case in its bearing upon an individual. Those who have followed Dr. Schmidt's endeavors through the Illinois Social Hygiene League and otherwise in the campaign to combat venereal disease, and those who have been acquainted with him through professional and personal contacts, have complete confidence that the motives which have animated him have been those of public service and not personal glory or financial gain.

An issue of larger moment transcends the personal aspects. The basis of Dr. Schmidt's removal, the Council of the Chicago Medical Society states, had nothing to do with the cost of medical care, but "rested solely upon a violation of the principles of medical ethics" (Official Bulletin of the Society, April 20, 1929, page 25). The state-

ment then quotes "the principles of medical ethics applicable to the case in question" which refer to publicity, advertising and the solicitation of patients. The Public Health Institute of Chicago, a non-profit organization, has for 10 years been conducting a large and successful pay clinic for the treatment of venereal disease under the management of a board of trustees, composed of leading business men in Chicago, and has employed paid advertising in Chicago papers. Dr. Schmidt has had no direct connection with the Institute, but is President of the Illinois Social Hygiene League, which about a year ago entered into a contract with the Institute, whereby the latter organization paid an agreed sum out of its current surplus to meet the deficit of the League. The Institute also assumed administrative supervision of the charitable clinic conducted by the League.

The advertisements of the Public Health Institute, at least during the last few years, have been directed toward informing the public of the dangers of syphilis and gonorrhea and the need for continued treatment under competent medical direction. The names of no individual physicians have been mentioned in the advertisements. The Institute's name and address has, of course, been given. The members of the lay board of trustees have printed their names in the advertisement as sponsors.

All those interested in public health, whether physicians or not, will unite in condemning the use of advertising or any other form of publicity which is for the profit or aggrandizement of individuals or organizations. The section of the code of ethics of the American Medical Association referring to advertising (Article I, Sec. 4) was extended a few years ago, mentioning "institutions and organizations" as well as individual physicians. The phrasing in this respect is somewhat indefinite. Certainly the public interest demands that there shall be an effective distribution of information concerning diseases dangerous to health, the importance of securing care and that there shall be made known to the public the resources in each locality, in private practice or in organizations, through which adequate attention can be secured.

Publicity of resources for care in venereal disease is especially important, but the principle is fundamentally the same in respect to informing the people about other conditions—tuberculosis, cancer, and diseases of infancy or maternity being examples. Whether publicity is in the form of paid advertising, unpaid news notices in the press, pamphlets, posters or other publications of an organization, seems of little significance, provided the intent is for public service and not for private gain, and that the subject-matter and wording are scientifically

correct, educational and discreet in avoidance of solicitation of patients or exploitation of individuals. The interests of the public health and the increasing demands of the general public for information render it of the highest importance that the code of medical ethics be not interpreted as to hamper properly worded and rightfully motivated publicity.

AN ANNUAL REPORT AND ROMANCE

ANNUAL reports are usually synonymous with boredom. If their subject matter is intrinsically interesting, its treatment frequently dampens the reader's enthusiasm. The appearance of a report which compares more than favorably with an attractive romantic novel therefore deserves special comment. Of all the topics ordinarily uninteresting to the reader, a water supply report is often the dullest, excepting to the enthusiastic technical worker.

Sir Alexander Houston, in the *22d Annual Report of the Metropolitan Water Board of London, for 1927,* escapes the deadening influence of precedent by announcing in the beginning of his report:

> All water supplies in their origin are exquisitely romantic. Water evaporates from the ocean and condenses to form clouds. The clouds burst, and millions of drops of rain, the jewels of heaven, fall on the mountains and hills and valleys to give us our springs, lakes, rivers and subterranean sources of supply. . . . If you love the beauties of nature, simple things like the flow of water from a tap can carry you in imagination to the uttermost ends of the earth; the skies, the oceans and the mountains will be yours; and, if you pause nearer home in your flight, the kindly hills and peaceful valleys, which nurse the water supplies to the great metropolis, will surely gain an intimate place in your hearts.

Having thus deliberately escaped from the necessity of presenting his findings in the usual humdrum form and language of annual reports, Sir Alexander then carries his reader through some 80 pages of delightful comment upon water supply problems. And the strange feature of the report is that it contains valuable technical information so frequently and successfully disguised that even a layman might read it from cover to cover.

The report is liberally illustrated with photographs, the effectiveness of which would do justice to any limited edition of our current works of art. Even Sir Alexander, however, feels that he must make apology for producing an entertaining, albeit valuable, annual report. In his review of the upland sources of water supply for the City of London, he graces the pages with such comments as:

Then we reach Harpenden, perhaps the sweetest name in all England, for it means " the valley of nightingales." Miss Ellen Terry, one of the most charming and talented actresses the English stage has ever known, lived for some years at Harpenden. Nearby is the celebrated experimental agricultural station of Rothamsted, whose fame extends throughout the civilised globe. In far distant days, about a mile north, on the borders of the two counties (Hertfordshire and Bedfordshire) many prize fights were fought.

On the same page, however, he apologizes that—

This, however, is a treatise on water supply and some persons dwell in water-tight compartments. The Philistines welcome no digressions; they see only the open road straight in front of them. Perhaps they are right in ignoring all matters not wholly relevant. Others look to the beginning and end of things, the alluring surroundings of a subject, the association of ideas, the belief that there is nothing under the sun which is not related, in greater or less degree, to a thousand other things, which to unseeing eyes may seem to be irrelevant. These are the hill-top worshippers who regard everything in life as wonderful, and who, rightly or wrongly, fail to see why even questions of water supply should be ruthlessly shorn of all the elements of romance, and be regarded wholly and without sentiment as a matter of quantity, quality and financial expediency.

Space is not available to discuss at any greater length the technical matters of importance in this report, but the reader we hope will be allured by the prospectuses so briefly noted above, to review it in its entirety as a beacon light in the dull field of gray-backed annual reports.

PUBLIC HEALTH ENGINEERING SECTION—SCOPE AND POLICY

ATTENTION is directed to the report of the Committee on Scope and Policy of the Public Health Engineering Section published elsewhere in this issue* of the JOURNAL. The duties and responsibilities of the engineering group to the public health profession are clearly stated, the delineation of policies is clean-cut, and worthy of much consideration by other specialized groups of public health workers. Nurses, hygienists, publicists, educators, and laboratory workers all have much the same relationship to the public health field and other branches of their profession as is defined for the engineers in this report. Far-sighted policies of this nature, developed on a carefully planned program, will mean much to the public health profession.

* See page 677.

ASSOCIATION NEWS

PUBLIC HEALTH PAVILION, UNIVERSITY OF MINNESOTA

THE DEDICATION OF THE MINNESOTA PUBLIC HEALTH PAVILION

A PUBLIC Health Pavilion is in process of building on the medical campus of the University of Minnesota. Its completion is planned in season for the Annual Meeting in Minneapolis of the American Public Health Association, the American Child Health Association, and the related organizations of national and state origin, gathering at the same time.

The convention guests have been invited to attend the Dedicatory Exercises on Tuesday morning, October 1, at which the American Public Health Association will assist.

The program will open at the Public Health Pavilion at 9 o'clock on that date, when the guests will be guided in an inspection tour of the new University Hospital buildings. They will then regather at the Public Health Pavilion.

Dr. Lotus Delta Coffman, Chancellor of the University, will preside. He will give the welcoming address and will introduce C.-E. A. Winslow, Dr.P.H., Chief of the Anna M. R. Lauder Department of Public Health, Yale University, who will make the Dedicatory Address.

The gathering will then adjourn to the Cyrus Northrop Memorial Hospital, now approaching completion, where the exercises will be continued.

There Harold S. Diehl, M.D., Chief of the Department of Preventive Medicine and Public Health, of the University of Minnesota, will speak upon "The Evolution of the University Student Health Service."

The concluding address, upon "The Relation of the University to Public Health," will follow, for which the speaker has not yet been announced.

At the close of the program, the guests will be invited to attend a complimentary luncheon in the ball-room of the Minnesota Union, at 12:30 o'clock.

Time will probably permit of a guided excursion through the Main Campus of the University.

Minnesota ranks today as the fourth, in point of registration numbers, of all the great universities of the country, and third among the state universities.

Its college enrollment, for the past school year, was 15,851 and its subcollegiate registration 3,073. The Extension Division and Correspondence

Schools listed 8,790; making a total of unduplicated individuals of 25,895.

On its City Campus are 43 main buildings, housing the College of Science, Literature and the Arts, including the Departments of Animal Biology, Botany and Physics; the College of Engineering and Architecture; the School of Law, the Medical School, including the Central School of Nursing, the Institute of Anatomy, the Cancer Institute, the Todd Memorial Clinic and the Department of Medical Technology; the College of Dentistry and the School for Dental Hygienists, the Departments of Physical Culture, the School of Mines and Metallurgy, the School of Pharmacy, the School of Chemistry, the College of Education, the School of Business Administration, the School of Music, the University Library, the Graduate School, the University Hospitals, and the Administration Services.

At a distance of some three miles lies the Agricultural Campus with its 27 buildings, housing the College of Agriculture, Forestry and Home Economics; the Central School of Agriculture and the Agricultural Experiment Station.

There are Station Schools of Agriculture and Experimental Laboratories at Crookston, Morris and Grand Rapids; and sub-stations at Duluth, Waseca and Zumbra Heights.

The guests of the University of Minnesota will receive a cordial welcome on the University Campus.

NOTE: The Minneapolis Local Committee will be materially assisted if members and guests planning to attend the dedication exercises and to be its guests at the luncheon at Minnesota Union will kindly send their names and addresses to the Executive Secretary of the Committee, 324 Citizens' Aid Building, Minneapolis, Minn., at an early date.

CYRUS NORTHROP MEMORIAL AUDITORIUM, UNIVERSITY OF MINNESOTA

REDUCED RAILROAD RATES

Persons attending the 58th Annual Meeting of the Association and related meetings in Minneapolis, September 30 to October 5, will be granted a rate of one and one-half times a one way fare by the railroads from the starting point to Minneapolis and return.

To obtain the reduced rate it is necessary to obtain from the ticket agent a reduced fare certificate when purchasing your ticket for Minneapolis. Do not purchase your return ticket. This reduction is available to all delegates and members of their families attending the Annual Meeting of the American Public Health Association and meetings of the following related organizations:

American Child Health Association
American Social Hygiene Association
International Society of Medical Health Officers
Northwest Conference of Child Health and Parent Education
Minnesota State Sanitary Conference
Minnesota State Public Health Association
Minnesota State Organization for Public Health Nursing
Conference of State Sanitary Engineers
American Association of School Physicians

Ask for a certificate for the meeting of the A. P. H. A. and related societies. This certificate when validated by the Executive Secretary of the A. P. H. A. at the Minneapolis meeting will entitle the purchaser to a return ticket at half fare.

Detailed information regarding railroad rates and transportation will be sent to all members of the Association and related societies the first week in August.

RAILROAD RATES FROM VARIOUS CENTERS TO MINNEAPOLIS

	Regular Rate One Way	Special Rate Round Trip	Lower Berth	Upper Berth
Atlanta, Ga.	$41.13	$ 61.70	$10.88	$ 8.70
Baltimore, Md.	42.44	63.66	12.00	9.60
Boston, Mass.	50.90	76.35	12.75	10.20
Buffalo, N. Y.	33.47	50.21	9.00	7.20
Chicago, Ill.	14.66	21.99	3.75	3.00
Cincinnati, O.	24.92	37.38	6.38	5.10
Cleveland, O. (via Orrville)	27.37	41.06	7.50	6.00
Dallas, Tex.	35.50	53.25	12.00	9.60
Denver, Colo.	32.04	48.06	10.13	8.10
Detroit, Mich.	24.47	36.71	6.38	5.10
Indianapolis, Ind.	21.28	31.92	6.38	5.10
Jacksonville, Fla.	53.36	80.04	15.38	12.30
Kansas City, Mo.	17.90	26.85	5.63	4.50
Los Angeles, Calif.	75.99	113.99	23.63	18.90
Louisville, Ky.	24.92	37.38	6.38	5.10
Memphis, Tenn.	31.93	47.90	9.00	7.20
Nashville, Tenn.	30.72	46.08	8.25	6.60
New Orleans, La.	46.11	69.17	13.88	11.10
New York, N. Y.	47.36	71.04	12.75	10.20
Omaha, Neb.	12.69	19.04	3.75	3.00
Philadelphia, Pa.	44.12	66.18	12.00	9.60
Pittsburgh, Pa.	31.54	47.31	8.25	6.60
Portland, Ore.	64.66	96.99	19.88	15.90
Salt Lake City, Utah	49.83	74.75	15.38	12.30
San Francisco, Calif.	75.99	113.99	23.63	18.90
Seattle, Wash.	62.56	93.84	19.88	15.90
St. Louis, Mo.	20.74	31.11	5.63	4.50
Toronto, Can. (via Chicago)	31.98	47.97	9.38	7.50
Washington, D. C.	42.44	63.66	12.00	9.60

Summer tourist tickets, which are on sale from May 15 to September 30 and bear the final return limit date, October 31, are in some cases cheaper than the regular convention fare. This is particularly true of the West. Consult your local agent.

VITAL STATISTICS CONFERENCE

According to an announcement by the U. S. Department of State on April 15, the United States Government will participate in an international conference to consider the revision of international classifications of the causes of death. This conference will take place in Paris in October of this year. The following have been appointed as delegates from the United States: Timothy F. Murphy, M.D., Chief Statistician for Vital Statistics, U. S. Bureau of the Census; Haven Emerson, M.D., Chairman, Committee on Accuracy of Certified Causes of Death and its Relation to Mortality Statistics and the International List, A. P. H. A.; George H. Van Buren, Chairman, Vital Statistics Section, A. P. H. A.; William H. Guilfoy, M.D., Chairman, Committee on Forms and Methods of Statistical Practice, A. P. H. A.;

W. J. V. Deacon, M.D., Chairman, Committee on Vital Statistics Training, A. P. H. A.; Jessamine S. Whitney, Statistician, National Tuberculosis Association; Rupert Blue, M.D., Assistant Surgeon-General, U. S. Public Health Service; Emlyn Jones, M.D., Chief, Bureau of Vital Statistics, Pennsylvania Department of Health; and Edgar Sydenstricker, Milbank Memorial Fund.

MINNESOTA STATE SANITARY CONFERENCE TO MEET WITH A. P. H. A.

At the 27th Annual Meeting of the Minnesota State Sanitary Conference held last month in Minneapolis, the conference decided to hold its 28th Annual Meeting at the time of the 58th Annual Meeting of the A. P. H. A. in Minneapolis, Minn., the week of September 30, 1929.

ARIZONA PUBLIC HEALTH ASSOCIATION

The Arizona Public Health Association held its meeting in Prescott, Ariz., April 16 and 17. The following were elected officers for the ensuing year: *President,* Harry T. Southworth, M.D., Prescott; *First Vice-President,* George Grove, Tucson; *Second Vice-President,* Arthur J. Kline, Prescott; *Secretary-Treasurer,* Jane H. Rider, Tucson; *Executive Committee,* H. A. Reese, M.D., Helene Thomas Bennett, W. J. Jamieson and G. F. Manning, M.D.

The association indorsed the invitation of the Texas Association of Sanitarians to the American Public Health Association to hold its 1930 convention in Texas.

DEATH OF EDITH HEDGES MATZKE

Edith Hedges Matzke, M.D., died very suddenly on April 7 at the Stanford University Hospital in San Francisco.

Dr. Matzke obtained her degree of M.D. at the Women's Medical College of Pennsylvania and her degree of Dr.P.H. at the School of Medicine, University of Pennsylvania. During her professional career she was associated with the following institutions: Stanford University, Cornell University, Inter-departmental Social Hygiene Board; University of Missouri, Women's Medical College of Pennsylvania, and the Health Clinic of College Hospital, Philadelphia, Pa. At the time of her death, she was actively engaged in private practice in San Francisco, Calif.

Dr. Matzke was a Fellow of the American Public Health Association and of the American Medical Association and a Collaborating Member of the American Social Hygiene Association. Previously she took an active part in the State Medical Societies of Pennsylvania, New York, Missouri, and California.

ASSOCIATION DELEGATES TO INTERNATIONAL CONGRESS

The American Public Health Association appointed as delegates to the International Congress of Public Health held in Zurich, Switzerland, May 15-20, Francis E. Fronczak, M.D., Commissioner of Health of Buffalo, N. Y., and Benjamin S. Stephenson, M.D., Health Commissioner of Shelby County, O.

TUBERCULOSIS CLINIC RECORD FORMS

The Sub-Committee on Record Forms of the Committee on Administrative Practice of the A. P. H. A. has prepared for distribution sample copies of a set of 5 tuberculosis record forms which may be considered as minimum standard forms.

The set consists of a family folder which affords space for recording the make-up of the family, a medical examination form for recording the individual medical history of each patient on his first visit to the clinic, a reëxamination form, a monthly report form, and an index card which contains

enough information to be usable as the basis of the monthly report.

The index card takes the place of the old fashioned ledger or day book, which can be dispensed with. Copies of this tentative set of forms may be obtained by writing to the American Public Health Association.

NEW MEXICO PUBLIC HEALTH ASSOCIATION

The Fifth Annual Meeting of the New Mexico Public Health Association was held at Carlsbad, N. M., May 2–4. The following were elected officers for the coming year: *President,* James R. Scott, M.D., Albuquerque; *Vice-President,* Edith Hodgson, R.N., Santa Fe; *Secretary-Treasurer,* Paul S. Fox, Santa Fe.

The association passed a resolution endorsing the Standard Milk Ordinance of the U. S. Public Health Service and recommending that the State Board of Public Welfare give its endorsement to this ordinance and urge its adoption by all larger municipalities in the state.

NEW MEMBERS

Edgar F. Allen, Elyria, O., President, International Society for Crippled Children (Assoc.)

Helen A. Bigelow, R.N., Fulton, N. Y., Public Health Nurse

Henry F. Burt, A.B., Providence, R. I. (Assoc.)

Dorothea Campbell, Charleston, W. Va., Director, Bureau Public Health Education, State Department of Health

Thomas H. Chesnutt, M.D., Moultrie, Ga., Commissioner of Health

Josephine L. Daniel, R.N., Jefferson City, Mo., Field Demonstration Nurse, State Board of Health

Vernon A. Douglas, M.D., Salem, Ore., City-County Health Officer

Louise E. Drake, B.S., Athens, Ga., Director of Health, State Teachers' College

Charles H. Eastwood, Jacksonville, Fla., Public Health Engineer, Wallace & Tiernan Co., Inc.

Leo F. Ey, Columbus, O., Acting Chief, Division of Laboratories, State Department of Health

Cameron St. Clair Guild, M.D., Tupelo, Miss., Director, County Health Department

Lillian R. Hamrick, Charleston, W. Va., Staff Nurse, Kanawha County Health Unit

Beatrice A. Harvey, R.N., Gering, Neb., School Nurse

Alma C. Haupt, New York, N. Y., Associate Director, Rural Hospital Division, Commonwealth Fund

Frank R. King, Madison, Wis., Director, Bureau of Plumbing, State Department of Health

Francis L. Love, Iowa City, Ia., City Health Officer

Joseph S. Maxwell, M.D., Beckley, W. Va., Health Officer of Raleigh County

Jere J. McEvilly, M.D., Little Falls, N. Y., Medical Inspector, Board of Education

Peter H. McNellis, M.D., Los Lunas, N. M., Field Agent, U. S. Public Health Service

Eugene E. Murphey, M.D., Augusta, Ga., President, Board of Health

Margaret L. Plumley, B.A., Chicago, Ill., Research Worker, Julius Rosenwald Fund

Evalina D. Reed, R.N., Provo, Utah, Supervising Nurse, Utah County Health Unit

Dr. George L. Schadt, Springfield, Mass., Laboratory Director, New England Laboratories

Edmund Schreiner, Albany, N. Y., Assistant Director, Division of Vital Statistics, State Department of Health

Byron W. Steele, M.D., Mullens, W. Va., County Health Officer

Eldred V. Thiehoff, M.D., Akron, O., Chief, Child Hygiene Service, City Health Department

E. T. Wetzel, West Union, W. Va., County Health Officer

DECEASED MEMBERS

D. E. Musgrave, M.D., Barboursville, W. Va. Elected member 1921

Ira W. Pickett, Cristobal, C. Z. Elected member 1921

Edith H. Matzke, M.D., Dr.P.H., San Francisco, Calif. Elected member 1921—Fellow 1923

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Summer Camps in Massachusetts—The Massachusetts State Department of Public Health recently asked for a camp licensing law, which failed to pass the legislature. The department is now offering to local health officers and camp authorities minimum standards for the health and sanitary conduct of their camps. These standards have been drafted by a committee of health officers and camp directors and approved by the Massachusetts Association of Board of Health, the New England Camp Directors Association, and the Massachusetts State Department of Public Health.

Every camp should be provided with a water supply of good sanitary quality and of sufficient quantity. Where available, flush toilets should be used. Where this is impossible, camps should be provided with suitable equipment for the disposal of sewage. No privy or receptacle for sewage or garbage should be located within 200 feet of any well or spring. The location of all sanitary conveniences should be clearly indicated to tourists. There should be proper receptacles for garbage, rubbish and other refuse. All living quarters, dormitories, kitchens, etc., should be properly screened. There should be a caretaker in charge.

For organizational and private camps, medical supervision is recommended, including a complete physical examination for each camper before starting for camp. Where there is no resident physician, arrangements should be made with at least two neighboring physicians to supply professional service when needed. There should be evidence of successful vaccination against smallpox, and typhoid fever immunization should be urged. Negative stool and urine specimens and a Widal should be required of the entire food handling personnel. All under 15 years of age should have a Schick test before going to camp, and active immunization is urged for all positive reactors. There should be daily medical inspection at camp and careful observation during the two weeks immediately following the opening of camp. The director should impress on the minds of the campers the dangers of contracting typhoid fever by drinking casually from brooks and ponds which are not known to be safe. Visiting should be limited as far as practicable. All milk used should be adequately pasteurized. So far as possible physical defects should be corrected before going to camp. There should be proper supervision of rest periods and courses of exercise. A definite food service is recommended incorporating a well balanced and healthful diet.

Diphtheria Prevention in New York City—The diphtheria prevention commission of the Department of Health in the City of New York has prepared, with the coöperation of the Milbank Memorial Fund, a book, *How to Protect Children from Diphtheria—A Handbook of Information*, which outlines the program inaugurated January, 1929. This booklet, copies of which can be obtained from Shirley W. Wynne, M.D., Commissioner of Health, is of historical value in that it outlines the progress of diphtheria control work in New York over a period of years. It contains numerous reproductions of

editorials which have appeared in the various newspapers. A list of stations at which immunization may be secured by parents is also included.

Inconsistent Hospital Death Records—The importance of accuracy in death records and statistical surveys should be apparent to everybody, and also the fact that misstatements are frequently worse than no statement at all.

In connection with a statistical survey of cancer prevalence in Pennsylvania, the hospitals of this state were requested to report the number of deaths from cancer occurring in such institutions during 1927. Seventy-four of the 239 institutions replying to the questionnaire gave the desired information, and in this group the original death certificates indicated 18 per cent more deaths from cancer than acknowledged on the questionnaire. Additional information was obtained by personal visit to the hospitals of Philadelphia and Pittsburgh, increasing the number of reporting institutions to 117, of which number 67 reported 411 fewer and the remaining 50 claimed to have 107 more cancer deaths than the original certificates indicated.

These discrepancies indicate the danger of placing too much confidence in data collected by the questionnaire method and suggest a lack of dependence upon such system for formulating definite conclusions. The inaccuracies were due to incomplete hospital records, to irregular methods of keeping such records, or to guesswork by the hospital record clerk in supplying the needed information. In a few instances the discrepancies were due to the selective methods of statistical practice in classifying causes of death. For instance, a man with intestinal carcinoma may be regarded by a hospital as dying of appendicitis or intestinal obstruction, but his death when classified by a statistician may be placed among the cancers. For purposes of statistical classification cancer is given preference over such important diseases as diabetes and tuberculosis, which might be regarded by hospital physicians as the actual cause of death.

Hospital records will show more deaths in hospitals than the state records, when the persons who make out the death certificates fail to put down the name of the hospital. This omission has been found to occur frequently. Hospital executives should be informed that all birth and death certificates used for hospital patients should be made upon blank forms kept in such institution. The name of the hospital should be distinctly written or printed on all blank certificates previous to their use. The diagnoses as recorded on the death certificates should correspond with the diagnoses entered upon the hospital records and in all instances the recorded information should be complete.—Harold B. Wood, M.D., Epidemiologist, State Health Department, Harrisburg, Pa.

LABORATORY

C. C. YOUNG

A COMPARISON OF SEITZ AND MANDLER FILTERS

N. W. LARKUM, PH. D.

Michigan Department of Health, Lansing, Mich.

ONE of the interesting and significant phases of the trend of bacteriology during the past ten years has been the emphasis placed upon filtration as a means of removing bacteria from fluid media. The study of bacteriophagy, the investigation of bacterial life cycles, the isolation of viruses, and the preparation of media, of antigens, and of antiviruses, have involved the use of filters to such an extent that apparatus of this kind must now be considered as an essential item in the equipment of a laboratory. In view of this fact, the selection of filters becomes a problem of some magnitude, which at present cannot be settled by the consultation of literature.

Although much valuable investigation of the physico-chemical properties of filters has been published, such reports have little direct application to the question of choice between several types of filters listed by supply houses. As a matter of fact, until quite recently there was probably little to influence one's choice. The advantages of one type were offset by its disadvantages and the issue was decided by the previous experience of the user.

The introduction of the Seitz filter, if the claims of the manufacturers and distributors can be accepted, has upset this equilibrium. So great is the apparent advantage of this filter that for many purposes it should entirely replace other types. The claims are based upon several published articles which, however, are not conclusive. They do justify a more careful and complete study. Such a study has been made, largely by comparison of Seitz and Mandler filters. The results are summarized and presented here.

The great advantage of the Seitz filter is that it is used once and discarded, thus obviating the necessity for cleaning and avoiding the difficulties attending incomplete removal of the chemicals used. Against this advantage must be checked the cost of sterile filtrate produced. Such a study entails a knowledge of the life of a Mandler filter and of the amount of sterile filtrate which a Seitz and a Mandler filter will yield. The former question is difficult to study by direct methods since it is obvious that too many factors must be taken into consideration.

Experience over several years during which Mandler filters 1″ x ⅜″ were largely used furnishes a basis for estimate which has been checked by a limited number of experiments. The average life of a Mandler candle of this size is about ten filtrations, irrespective of the amount of material filtered. There are individual candles with much longer lives, and there are many that are used after they should have been discarded. Certainly the bubble test as an indication of the value of a candle in giving a sterile filtrate is useless. The majority of candles end their career through breakage. Table I shows the record of twelve candles:

TABLE I

MANDLER SIZE 1" x 3/8"

No.	Test	Times Used	Amount Filtrate Sterile	Total	Fate
1	8 lbs.	8	1,400 c.c.	4,600	Broken
2	8	3	2,597 *	3,584	Broken
3	8	4	1,103	4,210	Discarded—leak
4	8	3	1,430	4,380	Broken
5	5	3	0	1,547	Discarded—no sterile filtrate
6	6	12	3,120	6,000	Broken
7	6	11	2,117	5,888	Discarded—leak
8	6	1	0	1,958	Discarded—poor filter
9	9	4	494	3,284	Discarded—leak
10	9	20	400	400	Still in use
11	9	6	180	180	Broken
12	9	8	240	240	Broken
Total		83	13,081	36,271	
Average		7	160 c.c.	437 c.c.	

* 2,211 c.c. of this total was sterile media before filtration.
Used to check air leaks in apparatus.

Thus an actual record of the life of several Mandler candles checks closely with the estimate. Other workers might obtain somewhat better results although it is scarcely possible that the difference would be great.

The amount of sterile filtrate obtained is not the maximum, for in many instances from 10 to 20 c.c. only were passed through the candle. In order to study this factor, comparative tests of Seitz and Mandler filters were run under identical conditions. Positive pressure was used and samples were collected every few minutes and tested for sterility. *B. typhosus* and staphylococcus were the cultures used. The results are given in Table II.

These figures are subject to considerable interpretation and might be analyzed more extensively than is possible here. The only conclusion that can be reached is that the Seitz equals or betters the record of the Mandler filter with respect to quantity of sterile filtrate. It is of interest to note further that one can depend upon this 20 c.c. size Seitz filter to yield from 100 to 200 c.c. of sterile filtrate. With the Mandler, one guess is as good as another as to the amount of sterile filtrate one may obtain. Again, experience in daily use of such filters checks these findings.

Over several years during which Mandler and Berkefeld filters were used for about ten filtrations daily (average amount of 50 c.c. to each filtration), I found that about 4 per cent of filtrates were contaminated in spite of all precautions. Seitz filters have been used in a similar manner during the past two years, and although the average amount filtered was greater, the percentage of contaminations has been reduced to less than 1 per cent.

Without taking into consideration the factor of time spent in cleaning, comparative costs decidedly favor the Seitz filter. Such costs can only be figured on the basis of cost per c.c. of sterile filtrate. The Seitz filter of the size used here costs $10, subject to discounts. Since, however, the metal parts are practically indestructible, this cost can be distributed over so many c.c.'s as to become negligible. The filter discs are listed 5 cents, subject to discount. One disc gives 390 c.c. of sterile filtrate; so

TABLE II

MANDLER

Filtration	Pressure mm. Hg	No.	Test mm. Hg	No. c.c. Sterile Mandler	Seitz
1	260	9	260	588	389
2	180	9	240	0	13
3	460	9	280	0	109
4	520	12	520	227	232
5	780	12	520	721	810
6	780	12	520	224	242
7	780	12	520	82	493
8	780	12	520	309	214
9	780	13	540	156	462
10	780	13	540	265	133
11	780	13	540	343	215
12	780	13	540	722	585
13	780	13	540	142	367
14	780	14	320	0	573
15	780	15	430	0	133
16	780	15	430	493	862
17	780	15	430	722	584
18	780	15	430	0	608
			Total	4,994	7,024
			Average	277 c.c.	390 c.c.

1 c.c. of filtrate costs less than 0.2 cents. Mandler filters list at $1.25 and have an average life of 10 filtrations. The average amount of sterile filtrate is 277 c.c. The cost per c.c. of sterile filtrate is nearly 0.5 cents. Thus the Seitz filter is about half as expensive as the Mandler. Whether this comparison would hold where larger sizes are concerned it is impossible to state on the basis of these data.

The cheapness of operation is not the sole consideration in the selection of filters. Differences in adsorptive capacities may render a given type unfit for certain uses. Because the composition of the Seitz filter differs from that of the Mandler, it may adsorb substances which the latter does not. So far as charge is concerned, both filters are alike (negative), retaining Victoria blue and allowing passage of Congo red. The Seitz, however, will remove about twice as much dye as the Mandler. Bacteriophage is not affected by passage through the Seitz filter.

The question of rate of filtration is directly associated with the problem of amount of sterile filtrate obtained, for time is certainly a factor in contamination. The statement is made by the distributors that Seitz filters are more rapid than other types. This is true when distilled water is filtered; with turbid fluids there is very little difference. The more rapid the filtration, the more quickly occurs the clogging of the pores and the consequent slowing of flow. If the quantity of fluid to be filtered is less than 50 c.c., there will be a slight saving of time by the use of the Seitz filter.

Another superiority which is claimed for the Seitz filter is the smaller loss of fluid due to retention in the pores. Records of a considerable number of filtrations show that these small filter plates adsorb about 2.5 c.c. of fluid. Some of this may be forced out by continuation of pressure when no visible fluid remains in the filter. This is done at the risk of contamination, however.

The average loss of fluid with the Mandler filter is 4.5 c.c. When small quantities of distilled water are passed through a Seitz disc, size 3, the minimum loss is 1.1 c.c.

Nothing has been said thus far regarding technic, although it is certain that the human factor can considerably influence the results. The writer's technic, so far as Mandler filters are concerned, may be subject to criticism just as is that of many Seitz users who have reported difficulties. The Seitz filter, having fewer parts and no rubber fittings, is decidedly less liable to permit contamination due to errors in technic.

SUMMARY

A careful study of the comparative efficiency of Seitz and Mandler filters has shown a distinct superiority for the former. The rate of filtration and amount of yield have shown some advantages for the Seitz. The adsorptive capacity of the two filter types is essentially identical. For many purposes the Seitz filter is unquestionably cheaper and more satisfactory than the Mandler.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

The Sex Factor in Infant Mortality—During the 10-year period from 1915 to 1924 inclusive, there were from 130 to 134 deaths from all causes among white male infants under 1 year of age, as compared with 100 deaths among white female infants in the U. S. Registration Area. An analysis of white infants in the birth registration area for the years 1918 to 1921 showed a high mortality sex ratio during the first month of life, a rise during the second month, and then a gradual decline in the ratio. It is found that the decrease in the ratio as age increases is due to a decrease in the susceptibility of the male, when the ratios for various groups of diseases are compared at various age divisions. The mortality sex ratio for diarrheal diseases among white infants for the years 1916 to 1921 in the birth registration area was 138 for the first month, 141 for the second month, 136 for the third month and 120 for the tenth to the twelfth months. After the first year of life the ratio continues to fall, so that during the fourth year the death rate for both sexes is about equal. Countries where the infant mortality rate is low have a high mortality sex ratio and those with high rates have a low ratio. Australia with an infant mortality rate of 69 in 1922 had a mortality sex ratio of 120, as compared with Chile, which had an infant mortality rate of 240, and a mortality sex ratio of 106.

Various environmental factors have been found to influence the mortality sex ratio. The relationship between infant mortality rate and the sex ratio in different regions varies. Thus for an infant mortality rate of 80 the sex ratio in England and Wales was 129 for the years 1841 to 1924, as compared with 122 in Sweden for the years 1751 to 1920. The mortality sex ratios for cities tend to be higher than for rural communities. Seasonal variations also occur in the mortality sex ratio. Between 1918 and 1922 the ratio for deaths from all causes showed a rise, starting in November and December, reaching a maximum in February and March, and then falling during the summer months. A similar seasonal

fluctuation occurred for pneumonia and for diarrheal diseases. The pneumonia ratio varied from 143 in February to 115 in August, and the diarrhea ratio varied from 141 in April to 122 in September. It is suggested that the regional and seasonal variations in the mortality sex ratio are dependent on the differences in the amount of sunlight reaching the infant. The greater need of the male infant for sunlight is indicated by his tendency to develop conditions such as tetany and rickets due to the instability of the calcium regulatory system.—Harry Bakwin, *Human Biology*, 1: 90–116 (Jan.), 1929.

All Benefit from Health Work—During the 20 years in which the Metropolitan's Welfare Division has functioned, the mortality of the company's industrial policyholders has declined at a rate twice as great as that in the general population. This is an important achievement; but even more important is the fact that the gain has extended to all age periods of life and to both sexes.

In early childhood, that is, at ages 1 to 4 years, the margin in favor of the insured, although considerable, is smaller than at all later age periods. But after age 5, this margin is very striking. At ages 10 to 14, 35 to 44, and 45 to 54 among males, and 15 to 19, and 45 to 54 among females, the drop in mortality among the insured approximated twice that for the general population. At ages 55 to 64, the improvement among the insured males was five times that shown for the general population, while among females it was more than 18 times as great. At ages 65 to 74, the insured registered substantial declines, although the death rate actually increased in the general population for each sex. It is particularly significant that, whereas the mortality of persons after 55 in the general population has either improved very slightly or has actually increased, the death rate among the insured has shown consistent, substantial declines. It is for this reason that the expectation of life of the insured, at the higher ages, is still increasing, while that of the general population stays near the earlier level.—*Stat. Bull.*, Met. Life Ins. Co., 10: 7–8 (Mar.), 1929.

An Inquiry into Asthma—An analysis was made of the records obtained from 404 patients suffering from asthma who were investigated by the Royal Infirmary of Edinburgh during the past 8 years. The first appearance of asthma was before the age of 20 in over 50 per cent of the cases. Of 139 cases in whom inheritance of asthma was noted, 59.6 per cent began to have the disease before the age of 20. Over 80 per cent of the patients were suffering from some respiratory infection just before the asthma started. Seven per cent of the patients had suffered from digestive disorders, 12.6 per cent from nasal conditions, 4.6 per cent from psychic disturbances, and 5.7 per cent from skin disease. Exposure to dust was recognized as an aggravating factor by 48 per cent of the cases. In about 13.5 per cent of the cases, asthma was due to exposure to pollen. Protein skin tests were tried out in 300 patients, and 50 per cent of these gave positive results. About 35 per cent of the patients stated that their attacks of asthma were quite independent of the weather. Among 65 per cent, cold and damp appeared the most likely weather condition to bring on the disease, and about 18 per cent of the cases objected to dry or warm weather. A certain proportion of the patients found that their asthma was definitely seasonal, the majority of the asthmatics being worst in winter and summer. Among 101 cases, the first onset of asthma was in the winter, among 90 cases in summer, among 63 in autumn and among 61 in spring. Nineteen per cent of the patients claimed

their asthma to be worst when at the seashore, 14 per cent when in the country, and 11 per cent when in the city. Psychic disturbances such as fright, worry or emotion induced attacks in 40.6 per cent of the cases. Of 112 females of active menstrual age, 46 per cent found their asthma worse at, or just before the period. Examination of the nose and throat was carried out in 299 cases on first reporting at the hospital. Nasal abnormalities were present in 63.1 per cent of the asthmatics examined.

The analysis of the case records has demonstrated the enormous importance of respiratory infections in the production of asthma in this district. It has also shown that the tendency to develop the disease at different periods of life is more uniform than was previously supposed.—*Lancet*, 1: 517–518 (Mar. 9), 1929.

Health of the American Indian—There are approximately 350,000 Indians in this country, and about 225,000 are wards of the government. Medical service has been provided for these Indians by the government since 1873. The general death rate among the Indian population for which there are records is about twice that for the U. S. Registration Area. In 1911 there was an Indian death rate of 35.6 per 1,000 population, as compared with 23.4 for negroes and 13.8 for whites. In 1924 there was an Indian death rate of 22.9, as compared with 17.8 for negroes and 11.2 for whites. Indians have the highest birth rate as well as the highest death rate among the three races. In 1915 there was an Indian birth rate of 35.3 per 1,000 population, as compared with 20.6 for negroes and 25.0 for whites. In 1924 there was an Indian birth rate of 31.5, as compared with 27.4 for negroes and 22.2 for whites. The death rate from tuberculosis among the Indians of the United States is today estimated to be more than four times the death rate from this disease among the white population. This is due in part to lack of racial immunity, unhygienic living conditions, and an inadequate or poorly balanced diet. From July to December, 1927, 25.4 per cent of the deaths among Indian wards of the government were from tuberculosis; 5.7 per cent were from pneumonia; 4.4 per cent were from diarrhea and enteritis under 2 years; and 4.8 per cent from violence. Trachoma has been prevalent among the Indians of the United States for many years. The incidence of this disease varies from 2 per cent in certain states to 20 per cent in groups in the Northwest. The prevalence of venereal disease is reported as slight, and does not constitute a factor in the health situation among most of the tribes. About 10,000 Indians have been vaccinated against smallpox, 4,000 against typhoid fever; and nearly 15,000 children have been protected against diphtheria by the administration of toxin-antitoxin.—M. C. Guthrie, *Pub. Health Rep.*, 44: 945–957 (Apr. 19), 1929.

The Health of Palestine and Trans-Jordania—A report was recently presented to the Council of the League of Nations by H. M. Government, on the administration of Palestine and Trans-Jordania for 1927. Palestine was comparatively free from epidemics of the more serious diseases. There were 1,001 cases of enteric fever with 76 deaths. Dysentery caused 1,782 cases and 31 fatalities. No cases of plague or cholera were reported. One case of smallpox occurred in Jerusalem, and as a consequence 34,000 inhabitants underwent vaccination. There were 3,305 cases of measles resulting in 324 deaths. The estimated population for 1927 was 778,369. There was a

birth rate of 50.4 per 1,000 population as compared with 53.5 in 1926. The highest birth rate of 56.1 occurred among the Moslem population, and the lowest of 35.1 among the Jewish. The general death rate was 28.0 per 1,000 population, as compared with 24.4 in 1926. There was an infant mortality rate of 201 per 1,000 live births. The highest rate of 217 occurred among the Moslems, as compared with the lower rate of 116 among the Jews.

In Trans-Jordania there occurred 66 cases of enteric fever with 6 deaths during 1927; 34 cases of influenza with 6 deaths; 66 cases of dysentery with 2 deaths; 154 cases of measles with 30 deaths; 37 cases of pneumonia with 7 deaths, and 14 cases of erysipelas with 1 death. There were single cases of smallpox and diphtheria which were imported. The steps taken to protect water supplies from contamination noticeably reduced the incidence of enteric fever and dysentery.—*Lancet*, 1: 592 (Mar. 16), 1929.

Gall-bladder Disease—An analysis from the standpoint of postoperative results was made of 109 cases of gall-bladder disease operated on at the Free Hospital for Women, Brookline, Mass., between 1905 and 1926. Tuberculosis and cancer were each found in 6.4 per cent of the family histories. Seventy per cent of the patients had undergone operations of some kind. Typhoid fever was found in 11 per cent of the past histories, and gall stones had been noted present in 8 patients at previous operations. Ninety-two and six-tenths per cent of the patients were married, and 83.5 per cent of these had borne children. The onset of symptoms of gall-bladder disease was definitely related to pregnancy in 18.6 per cent of these patients. The predominant age of onset was found to be from 25 to 40 years, and the majority of operations were performed between the ages of 30 and 45 years. The duration of symptoms in most cases covered a range of from 1 month to 21 years. No deaths occurred among the 109 patients submitted to operation. In 80 per cent of the cases the convalescence was uneventful.

A follow-up of the cases brought information from 72.5 per cent. Sixty-eight of these had postoperative intervals of at least 2 years, 49 of 5 years, 42 of 8 years, 29 of 10 years, and 17 of 12 years. Ten deaths were reported, none of which was directly traceable to operation. Complete relief from symptoms was reported by 60.8 per cent of the patients, more among those with cholecystectomy than cholecystostomy. Twenty-eight per cent had occasional digestive upsets, and 11 per cent reported recurrence of typical gall-bladder attacks. Inability to eat certain foods, especially fats and fried foods, was reported by 19 per cent of the cases. Five per cent had symptoms probably due to obstructing adhesions. Twenty-five patients reported gains in weight of from 10 to 65 pounds. Twenty patients stated that there were no hernias in the gall-bladder scars, and two reported some bulging in that region. Fifty-seven cases failed to mention hernia.—George A. Marks, The Late Results of Operation in 109 Cases of Gall-Bladder Disease, *New England J. Med.*, 200: 587–592 (Mar. 21), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

SCOPE AND POLICY *

PUBLIC health engineering may be defined, briefly, as the practice of those engineering arts which affect public health, or, more elaborately, as the application of the laws of science, including those of physics, chemistry, and biology, to the betterment of man's environment. One of the best descriptions of the field of public health or sanitary engineering may be found in the address given by Harrison P. Eddy before the Sanitary Engineering Division of the American Society of Civil Engineers. After reading this, one is better able to visualize the intimate relationship between engineering practice and the improvement of the public health.

It has been a long time since public health work was exclusively of a medical nature and it would be as absurd to expect a man with only one kind of training to be proficient in all kinds of public health work as it would be to expect a modern priest to heal wounds and build bridges as did his ancient prototype.

Specialization in public health work has been growing; the present make-up of this Association indicates that growth and its diversity better than anything else. During the latter part of the last century, there were in the Association but few chemists, bacteriologists, social workers, or vital statisticians, and there were no nurses nor child hygienists. Meetings were rather formal and the subjects discussed now seem odd. Nevertheless, the quality of the workers and the work done were excellent and we look back with pride upon the early meetings.

The laboratory workers were the first to form a section; then came the others in turn until we now have a number of groups of specialists.

It should be the paramount aim of each section to serve not only its own particular group of specialists but also the Association. One of the principal ways in which the Association may be served is by extending to the groups in other sections sources of information, thereby permitting them to benefit. On the other hand, the engineers making up this section should be expected to benefit by their contacts with those who are primarily interested in administration, medical, or educational phases of public health work.

It is, therefore, an important function of the Public Health Engineering Section to conduct its meetings so that the results of engineering work may be presented to the lay and professional members of the association in an understandable manner. This means that this section is not the place for papers on hydraulics, mechanics, or details of engineering construction, but for those which connect engineering methods and accomplishments with public health work.

Engineering societies, associations of water works men, and sewage works associations offer the best outlets for technical papers in those fields. This sec-

* Progress report of the Committee, presented at a Luncheon Session of the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

tion's meetings should be the place for interpretive and educational papers on the relationship between the engineering arts and the improvement of the public health.

The field of work of the members of the Conference of State Sanitary Engineers is very closely related to that of the members of this section, and it is the hope of the committee that in the future the meetings of this Conference may be more closely associated and coordinated with those of this section.

Even with the relegation of highly technical papers to other associations, there still remains a group of engineering subjects which need consideration and which have no forum other than this section in which they may be presented. The committee refers here to such works as drainage, shellfish sanitation, rat extermination through better building construction, ventilation, housing, and others. Until these lines of work develop to where each has its own parent association where it may be discussed, this section should provide for the proper expression of results of work in these respective fields.

Some thought should also be given to the desirability of preparing manuals of practice, like the *Standard Methods of Water Analysis* fostered by the Laboratory Section. Although there seems to be no particular need for this work at present, the future may indicate the necessity for such manuals of procedure.

It is only rarely that the engineer becomes a mouthpiece of public health information. That function should be relegated to other workers, such as the health officer or the teacher, both of whom come in direct contact with the public; whom the public understands; and to whom it looks for authoritative information. The assumption of this attitude does not place the engineer in a position of servility, nor does it cause the loss of any professional dignity, for no one recognizes the contributions of engineers to the improvement of public health or is more dependent upon engineers for counsel and assistance than the modern conscientious health officer.

The scope of activities of this section, therefore, should include the zone where engineering borders upon public health and the policy should be to serve its members daily by informal contact, and the Association by bringing engineering results and methods into public health work and to the attention of public health workers.

That such service will benefit the server even more than the served is the experience of the human race.

R. S. WESTON, *Chairman*
EARLE WATERMAN
W. F. WELLS
V. M. EHLERS
ABEL WOLMAN

Lethal Effect of Chloramine on Mosquito Larvae—The subject is dealt with from the water purification point of view, but the investigations cover only rain water with a single species of larva. The primary object of the tests was to ascertain if it were possible to eliminate larvae from a water by means of chemicals without affecting its potability. Tables of concentrations and the effects of chloride of lime and ammonium sulphate, applied together, and of other chemicals are given. The results show that (a) it is possible to kill mosquito larvae in a water by means of chemicals which are ordinarily used in water treatment; (b) in a water chemically very impure, mosquito larvae (*C. pipiens*) are killed in 24 hours by a concentration of 1 in 50,000 (expressed as Cl) of a mixture of chloride of lime and ammonium sulphate; (c) if such

treatment is followed by the addition of sodium hyposulphite, the water has no obnoxious odor or taste; (d) with chemically purer waters, lower concentrations of chloramine would be effective.—B. A. Adams, *Med. Off.*, 65, 1928. (From papers of Water Pollution Research Board, England.)

Purification of Sewage Containing Large Amounts of Dyestuffs by the Activated Sludge Process—Laboratory experiments show that the activated sludge process is capable of removing the septicity of sewage containing dyestuffs but that the complete removal of the dyes necessitates other means of purification, such as filtration through clinker.—Pritzkow and Jordan, *Wasser u. Gas.*, 18: 553, 1928. (From papers of Water Pollution Research Board, England.)

Bacterial Pollution of Bathing Beach Waters in New Haven Harbor—A study was made of the pollution of water in the New Haven harbor at bathing beaches. Eleven sampling stations were established on the West shore, 3 in the Quinnipiac River and 16 on the East shore. Samples were collected at each harbor station on eleven different days in the period from November, 1926, to April, 1927.

There is a sketch of the harbor showing location of the sampling points. All samples were (a) plated on plain nutrient agar for incubation for 48 hours at 20° C.; (b) plated on eosin-methylene-blue agar for incubation for 36 hours at 37° C.; and (c) inoculated in 0.1 and 0.01 c.c. dilutions of lactose broth for incubation at 37° C., and subsequent examination of tubes showing gas for *B. coli*.

The results are recorded in tables for comparison at the various stations. The direction of the wind is given as the chief factor in the pollution of these bathing beach waters.

Among the conclusions drawn are that the bathing beach waters of New Haven harbor are highly polluted and at certain points are so heavily polluted as to be manifestly unfit for bathing. A comparison is made in this article between the results of this study and the limits set by the Conference of State Sanitary Engineers and the standard generally accepted in the State of California.—C.-E. A. Winslow and David Moxon, *Am. J. Hyg.*, 8, 3: 299–310 (May), 1928. Abstr. A. L. Dopmeyer.

Contribution to the Knowledge of Sewage Chlorination—A study has been made of the effect of chlorination on the subsequent biological purification of sewage at a small suburban sewage disposal plant at Nürnberg. This consists of septic tanks and a percolating filter, and recently, owing to an increase in population, it has been considerably overloaded. In order to avoid extending the plant, which will shortly be superseded by a larger central works, a chlorinator was introduced before the percolating filter. The dose applied varied from 15 to 25 p.p.m. The effect of chlorination was to remove the odors, prevent the clogging of the filter and reduce the septicity of the final effluent. The oxygen demand of the filter influent was reduced by 14.3 per cent. The biological purification effected by the percolating filter, as measured by the reduction in permanganate and biochemical oxygen demand, was not, however, increased by chlorination.—E. Merkel, Paper read before Verein deutscher Chemiker, *Chem. Ztg.*, 52: 451, 1928. (From papers of Water Pollution Research Board, England.)

Chlorinated Copperas—A New Coagulant—Elizabeth City, N. C., takes water from Knobb's Creek and is facing the problem of reducing the color from 150 to 550 p.p.m. in the raw water to 7 to 10 p.p.m. as delivered to

consumers. The color is present as negatively charged colloidal particles as determined by dialysis and cataphoresis. A modern rapid sand filtration plant was ineffective.

Summary and conclusions: (1) Copperas (ferrous sulphate) and lime are not satisfactory coagulants at Elizabeth City, N. C., unless the copperas is oxidized to its ferric state; (2) prechlorination with reasonable doses does not improve coagulation of the highly colored water at Elizabeth City, N. C., when applied in the mixing chamber; (3) prechlorination reduces the tendency of the sludge in the coagulation basins to ferment; (4) single coagulation with any of the coagulants employed is not satisfactory because of the color and residual coagulant left in the filter effluent; (5) to produce an acceptable filter effluent "split" application of coagulants is essential. The primary coagulation must take place between pH 4.2 and 4.7, and the secondary coagulation between pH 5.5 and 6.5; (6) copperas, completely oxidized with chlorine in the ratio of one part of chlorine to 7.8 parts copperas, produces a coagulant superior to alum in color removal qualities and is more economical because of its higher efficiency; (7) a combination of chlorinated copperas, alum and lime or sodium aluminate produces an attractive and economical filtered water as evidenced by comments of consumers and cost data; (8) conversion of ferrous sulphate (copperas) to the ferric state is readily accomplished by introducing chlorine water from a chlorinator into the discharge line from the copperas feeding machine or solution tank. The reaction between the copperas and the chlorine is practically instantaneous, requiring less than 20 feet of travel for completion.—L. L. Hedgepeth and N. C. and William C. Olsen, *J. Am. Water Works Assn.*, 20, 4: 467–472 (Oct.), 1928. Abstr. C. G. Gillespie.

Iodine in Drinking Waters—In England no such correlation was found between presence of goiter and low iodine content of drinking water as has been reported in Switzerland and the United States. The loss of iodine due to filtration at Aberdeen and Edinburgh was insignificant, but a 50 per cent loss was found in Canterbury water after softening with lime. The mineral waters from Harrogate and Cheltenham have a much higher iodine content than ordinary drinking waters, which may partly account for their medicinal value. The authors caution against two possible sources of error in the determination of iodine in the case of (a) hard waters, and (b) acid mineral waters.—J. B. Orr, W. Godden and J. M. Dundas, *J. Hyg.*, 27, 2: 197–199 (Jan.), 1928. Abstr. A. W. Fuchs.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Legislation in Various Countries Regarding Silicosis with Special Reference to Compensation—The author summarizes the legislation and compensation provisions regarding silicosis in Great Britain for the refractories, metal-grinding and other silicosis industries through the scheme which became operative on February 1, 1929. It is the most comprehensive that has yet been considered and applies to:

(a) All processes in which dust may be created in mining, or quarrying, or any other form of the manipulation of quartz, quartzite, ganister, sandstone, grit-stone, and chert; but it does not apply to any rock containing less than 50 per cent free silica; (b) Foundries and metal works in processes in which dust arises from (i) articles containing not less than 80 per cent total silica, (ii) fettling steel castings, and (iii) sandblasting with sand, crushed silica rock or flint; (c) Potteries in processes which incur exposure to dust from flint or quartzose sand; (d) Tin mines in processes which incur exposure to dust from the ore or ore containing rock.

The discussion concerns legislation in: the Union of South Africa, with broad provisions; Australia and its component states, New South Wales, Victoria, and Tasmania, in the latter two of which no compensation is granted for silicosis; Ontario, the only Canadian province with legislation definitely naming silicosis (its compensation is somewhat similar to the South African scheme); Alberta, whose Compensation Act of 1925 recognizes miners' phthisis as an industrial disease; British Columbia with a broad act (1925) which does not exclude occupational diseases from compensation, but does not refer definitely either to miners' phthisis or to silicosis; and Nova Scotia of which the same is true.

In the United States, silicosis is not directly named in any law allowing compensation, but the tendency

. . . is for the language of the laws to be sufficiently broad to cover occupational diseases generally and to allow an interpretation including silicosis. Probably indeed awards for compensation have been made for silicosis as an occupational disease without being named as such in the law of the award, as for example in Wisconsin for irritant dusts.

For federal employees the wording used probably allows an interpretation including silicosis. Silicosis is apparently compensable in the broad acts of California, Connecticut, and Wisconsin. Occupational diseases, including silicosis, are also required to be reported in Maine, Maryland, New Hampshire, New York, Ohio, Porto Rico, and Rhode Island. In Minnesota and New Jersey physicians are called upon to report only diseases included in a definite list which does not include silicosis. No other countries have legislation with regard to compensation for silicosis. (A discussion of 10 pages follows.)—E.-L. Collis, *Rapports*, Apr., 1929, pp. 133–159.

Notes on a Fine Type of Fibrous Pneumonokoniosis Produced by Silicates and Other Minerals—Author's Summary—The etiology is discussed of the fine fibrosis of the lungs which is not uncommonly found in metalliferous and coal miners and some workers in other industrial activities in New South Wales. It is considered that this fine type of fibrosis can in most cases reasonably be assumed to be caused by various silicates. The term "silicatosis" is suggested for the fine fibrosis caused by silicates and the term "sili-

conosis" for a fibrous pneumonokoniosis of a mixed type. The type of fibrosis is considered in workers exposed to orthoclase basalt, coal miners, copper miners, and miners in Broken Hill, Western Australia and Tasmania; iron miners, asbestos and cement workers. The compensation laws of New South Wales relating to pneumonokoniosis are summarized and it is concluded that all fibrous pneumonokoniosis not due to dust containing over 70 per cent of quartz should come under the Workers' Compensation Act, 1926; and the Workers' Compensation (Silicosis) Act, 1920, which provides compensation for diseases caused by silica dust, should apply only to workers who are exposed to dust containing over 70 per cent of quartz.—Charles Badham, *Rep. Director-General of Pub. Health,* New South Wales, for the Year ended December 31, 1927, Section I-E, Industrial Hygiene, Serial Study No. 13, pp. 102–110.

Dust Sampling in Sydney Sandstone Industries—The Greenburg-Smith impinger used in gravimetric sampling was shown to agree with that determined by calculation if the particles are regarded as spheres. The average dust exposure of men using axial water feed drills in tunnels with varying degrees of ventilation has been determined at 110 particles per c.c. In the case of Sydney sandstone masons, the average dust concentration was equivalent to 420 particles per c.c. The Dust Standards of South Africa and Broken Hill (N. S. W.) require not more than 200 particles of less than 10 μ per c.c. of sandstone dust. Counting by the Owens' jet dust apparatus and by the Greenburg-Smith impinger shows both unrivalled for efficiency and ease of manipulation.—Charles Badham, H. E. G. Rayner and H. D. Broose, *Rep. Director-General Pub. Health,* New South Wales, for the Year ended December 31, 1927, Section I-E, Industrial Hygiene, Serial Study 12.

Silicosis among Sandstone Workers—Much fuller and more precise information than had already been obtained was desired about quarrying and stonemasons' work. The areas investigated were 9 in number, scattered from Glasgow to Bristol. Actually, 454 clinical examinations were made, with 266 radiographical examinations. The workers constituted 14 occupational groups and a precise method of securing particulars was followed in each case. A total of 171 *masons* was examined, of whom 116 were X-rayed and 57 found to be suffering from silicosis. Of 65 *rock-getters,* 33 were X-rayed and 13 showed silicosis. Out of 115 *quarrymen,* 67 were X-rayed and 33 showed silicosis. Similarly, 39 *planers* were examined, 23 X-rayed and 5 showed silicosis. The other occupational groups showed much less silicosis.

Of 112 positive cases found, 90 were in the first stage, 21 in the second and 1 in the third (corresponding respectively to the "ante-primary," "primary," and "secondary" terms used in South Africa). Only 1 definite open case of tuberculosis was found, but the inquiries were limited to those who were actually at work, thus preventing a determination of the total amount of tuberculosis present.

The vast majority of workers had been employed on so many different kinds of stone that it was impossible to differentiate effects. (No petrographic or chemical analyses of the stones are given.) Descriptions of 36 different cases are given. Silicosis appeared to become more common after 40 years of age and after 20 years of exposure in the stone industry. (Detailed tables accompany.)—C. L. Sutherland and S. Bryson, *Report on the Occurrence of*

Silicosis among Sandstone Workers. Medical Board under the Refractories Industries (Silicosis) Scheme, H. M. Stationery Office, Adastral House, Kingsway, London, W. C. 2, 1929, 41 pp.

Silicosis in the Pottery Industry—The history of the subject leading up to special powers for dealing with silicosis, the evidences of silicosis in the pottery industry, an outline of the two existing schemes, and proposals for a new scheme are taken up in Part I of this report. It is recommended that the scheme apply to any process in the milling of flint for use in potteries, all processes in the manufacture of potteries and in polishing, grinding and tile-slabbing. However, it is recommended that engine men and stokers and their assistants and workmen employed in modelling and mouldmaking, where carried on in separate rooms, might be excluded. The employers preferred that each employer be made personally responsible for liability in respect of the workers he employs. Both partial and complete compensation are provided for and the provisions of the scheme already in force for compensation in the metal grinding industries (1927) are recommended.

The committee strongly recommends that a special medical board for silicosis cases be set up. "The reasons why the committee prefer the employment in silicosis cases of a medical board rather than a single medical practitioner are fully discussed in their first report. Stated briefly, they are that it is only by a board constituted as indicated, that really satisfactory results can be obtained. The diagnosis of silicosis still presents such difficulties that it is undesirable to leave it to a single officer nor is it fair to the officer to impose on him such a heavy responsibility. Further, it is only by means of a board that uniformity and continuity of practice can really be secured."

Part II consists of detailed regulations for the prevention of silicosis. An appendix includes the report of conferences between medical members of the committee and the medical advisers of the employers and operatives, including some criticism, the questions of diagnosis, radiographic examinations, interpretation of films, classification of the disease, medical examinations and the processes to be included in the scheme. —*Report of the Departmental Committee on Compensation for Silicosis Dealing with the Pottery Industry.* Workmen's Compensation (Silicosis) Committee, Home Office, Great Britain, H. M. Stationery Office, Adastral House, Kingsway, London, W. C. 2, 1928, 41 pp.

The Diagnosis of Silicosis as an Occupational Disease—The paper deals solely with silicosis as it appears in the Gold Mines of Witwatersrand. The criteria adopted by the Miners' Phthisis Medical Bureau have been reached by a careful correlation of the results of pathological, radiographical, and clinical examination in a large series of individual cases. "Silicosis" or "miners' phthisis" as met here is the product of two factors: dust and tuberculosis. The silicotic process precedes and is essentially a progressive lymphatic fibrosis which begins at many points and develops very gradually. The degree or stage of a simple silicosis may be described in terms of the number and size of nodules which are present. In the majority of cases of apparently simple silicosis there is an early element of latent tuberculous infection with certain of the silicotic lesions. While acute infections may be present in the silicotic lung in an unmodified form, chronic infections tend to undergo modification by the production of a

massive infective fibrosis (tuberculosilicosis).

A change of type in the cases of silicosis has occurred in the Witwatersrand, accompanying the measures taken for the reduction of dust in mine air—pathological evidences point to the early presence in the majority of cases of an element of latent tuberculous infection. In fact, the onset of a tuberculous infection may sometimes bring to light latent silicosis. The legal definitions of the stages of silicosis in the Act of 1925 of the Union of South Africa cover the *ante-primary stage*, the *primary stage*, and the *secondary stage* (definitions given). Furthermore, tuberculosis means tuberculosis of the lungs or of the respiratory organs, and a person is deemed to be suffering from the same whenever the Bureau finds either (a) "that such person is expectorating the tubercle bacillus"; or (b) "that such person has closed tuberculosis to such a degree as seriously to impair his working capacity, and render prohibition of his working underground advisable in the interests of his health."

Regarding the monetary aspect, cases in the two earlier stages received "lump sum" awards averaging about £400 for the ante-primary stage, with an additional 50 per cent for the primary stage. Cases in the secondary stage, if resident in South Africa, receive a life pension, with additional allowances for dependents; the average inclusive payment is a little over £200 per annum. Allowances are paid to dependents in case of the miner's death. One important restriction is imposed. If a miner who has been notified that he has silicosis elects to continue work underground for more than 3 months, he forfeits all awards other than that to which he became entitled when first notified. But if eventually he dies from a cause to which silicosis is contributory, his dependents receive their prescribed allowances. The total disbursements for all classes of cases have amounted during the past 3 years to approximately £1,000,000 per annum.

The clinical and radiographic diagnosis of silicosis is illustrated by a series of 22 radiographs representative of different pulmonary fibroses. A characteristic feature of silicosis in the lungs is that it is a generalized condition. The most reliable single diagnostic criterion is the radiograph, provided that this is of high technical quality and is taken instantaneously, but it must be supplemented by an expert clinical examination. The decision in cases such as silicosis should rest with a specially selected body of medical examiners who have wide experience of the disease, clinical, radiographic and pathological (nine pages of discussion follow).—L.-G. Irvine, *Rapports* (see above), pp. 43-91 (Apr.), 1929.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Antigenic Properties of Evaporated Milk—This study was made in an effort to find a more desirable substitute for mother's milk as a food for infants who display food allergy due to sensitization to cow's milk. This investigation is based on the theory that heating certain proteins so changes them that new antigens are formed.

Sensitization tests on guinea pigs and immunization studies in rabbits were made using raw, pasteurized, and evaporated milks. It was found that the milks yielded caseins nearly alike in regard to the minimum quantities of this protein required to produce fatal anaphylactic shock in guinea pigs sensitized to the three types of milk. However, large differences were found when the proteins from whey were compared. The minimum amount of whey proteins from evaporated milk required to produce fatal anaphylactic shock in guinea pigs sensitized to raw milk was 30 times greater than the minimum of whey proteins from raw milk, and it was 40 times greater than that from pasteurized milk in guinea pigs sensitized to pasteurized milk.

The precipitin and complement fixation reactions showed that casein from evaporated milk is very similar to that from pasteurized milk in antigenic activity. There were marked differences in the antigenic properties of the whey protein from the two types of milk. Five times as great a quantity of pasteurized whey protein as of evaporated whey protein was required to produce a precipitate in the presence of serums from rabbits immunized to evaporated milk, whereas when serums from rabbits immunized to pasteurized milk were tested, it was found that approximately 25 times as much evaporated whey protein as pasteurized whey protein was required to produce a precipitate. Approximately the same difference in antigenic properties of the whey proteins from the two types of milk was shown in the complement fixation tests. This indicates a change of specificity whereby heated whey proteins are less reactive in animals sensitized with raw or pasteurized milk, or with antibodies against pasteurized milk.—Oran I. Cutler, *J. A. M. A.*, 92: 964 (Mar. 23), 1929.

Unsuccessful Attempt to Produce Salmonella Intoxication in Man—In order to obtain human experimental data on the problem of whether or not thermostabile toxins, capable of causing illness in the absence of living organisms, are formed by *S. aertrycke* or *S. enteriditis*, 24 people ranging in age from 20 to 40 years were fed heat-killed cultures, or filtrates of cultures, of these two members of the Salmonella group. The 9 strains used had been isolated from food poisoning outbreaks. The heat treatment of the cultures consisted of boiling for 20 minutes in a water bath, and the filtrates were obtained by passing a portion of the culture through a Mandler filter. The cultures used were obtained by incubation for periods varying from 6 hours to 20 days. All the strains used were toxic when injected intravenously into rabbits. The subjects were all fed on an empty stomach, receiving only the culture or the filtrate with a small amount of water. In no case was there vomiting, headache or diarrhea, and there

was no change in blood titer against homologous strains 10 days after feeding. None of the persons fed noted any subjective symptoms.—G. M. Dack, W. E. Cary and P. H. Harman, *J. Prev. Med.*, 2: 479 (Nov.), 1929.

Indian Ephedras, Their Extraction and Assay—Many species of *Ephedra* are known. The Chinese species have been reported to contain from 0.018 per cent to 1.32 per cent of total alkaloids. The American species contain none. This study embraces *E. Gerardiana*, *E. intermedia*, and *E. foliata*. The first of these contains from 0.4 to 1.25 per cent of alkaloids, the second from 0.1 to 0.3 per cent and the third none. The altitude at which the plants are grown has no effect on the alkaloidal content, but the rainfall exerts a distinct influence; the greater the rainfall, the smaller is the content of alkaloids. The method of extraction employed consists in cold maceration of the finely powdered drug with a mixture of ether (3) and chloroform (1) rendered strongly alkaline with ammonia. This process eliminates the red coloring matter which is present in the stems of the Indian Ephedras and which is extracted by cold alcohol. The liquid is decanted through a filter and the residue treated twice more with fresh solvent. The combined extracts are distilled and the residue is extracted with 1.5 per cent hydrochloric acid until the alkaloids are removed. The combined acid extracts are filtered, made strongly alkaline with potassium carbonate, and the solution almost saturated with sodium chloride. The mixture is shaken 4 times with ether, the bulk of the ether distilled and the residue allowed to evaporate spontaneously. An excess of 0.1 *N*-hydrochloric acid is added and the excess titrated with 0.1 *N*-sodium hydroxide, using methyl orange as indicator.

For large scale extraction of ephedrine, the method found most suitable was extraction of the finely powdered drug with 5 times its weight of cold 0.5 per cent hydrochloric acid. The acid treatment was repeated twice. The mixed acid extract was filtered and neutralized with sodium carbonate till just neutral to Congo, but acidic to litmus. After concentration on the water bath, the solution was made strongly alkaline with sodium carbonate, the precipitate separated and washed with little water, the washings being added to the filtrate. To the filtrate, which contained most of the alkaloids, a large excess of sodium chloride was added and the solution extracted 4 times with ether. The solvent was removed by distillation and the alkaloid residue converted into the hydrochloride by neutralizing with hydrochloric acid. After concentration at 45 to 50° the hydrochlorides crystallized. After drying, the residue was treated with dry chloroform to dissolve the hydrochlorides of other bases, leaving pure ephedrine hydrochloride. A further quantity of ephedrine was recovered from the precipitate, previously removed, by boiling with benzene.—S. Krishna and T. P. Ghose, *Trans. J. Soc. Chem. Ind.*, 48: 67 (Mar. 22), 1929.

Some Comparisons of the Nutritive Value of Whole Wheat Bread and White Bread—White bread and whole wheat bread were compared in this experiment, using albino rats as test animals, to demonstrate their relative nutritive values when they were used as the sole sources of (1) vitamin B complex (F and G), (2) protein, and (3) minerals. It was found that in diets supplemented in respect to other nutrient factors respectively, whole wheat bread was superior to white bread as a source (1) of vitamin G, (2) of protein, and (3) of minerals. Although these experiments have shown the superiority of whole wheat bread

over white bread, it is unnecessary to be concerned over the deficiencies of white bread and discredit its value in the diet, nor is it necessary to advocate the use of whole wheat bread. The dietary habits of the American people are such that any deficiencies of one food item, such as bread, may be amply supplemented by other foods—eggs, dairy products, and vegetables. But where bread constitutes an unduly large proportion of the diet, then the deficiencies of white bread may lead to malnutrition, which could have been prevented by the use of whole wheat bread.—S. M. Hauge and Aneta P. Beadle, *J. Home Econ.*, 21: 199 (Mar.), 1929.

The Mineral Content of Grain—This article is a summation of whole grain analyses made over a 10-year period at the Utah Experiment Station. Figures given are based on analyses of 1,775 samples of wheat, 1,205 samples of oats, 110 samples of barley, and 75 samples of corn. These grains were grown: on both irrigated farms and dry farms; on soils varying widely in composition in respect to "alkali," calcium, sulphur, and gypsum. Determinations were made of ash, calcium, magnesium, potassium, phosphorus, sulphur and iron. The maximum, average and minimum percentages of each of these determinations for each grain are set forth in tables. In general, the figures reported for Utah-grown grains are higher than those previously reported by other workers on grains from other sources. The authors attribute this to the composition of the soil and of the irrigation waters. Using the wheat analyses as a crude measure, the authors estimated the effect of irrigation, soil and variety on the mineral content. For ash, they estimated the extreme variations due to irrigation water to be 46 per cent, variety 31 per cent, and soil 118 per cent. Wheat showed the widest variations and oats the highest average content. Soil, irrigation water and variety caused 600 per cent, 260 per cent, and 200 per cent variations respectively in wheat. Less variation was found in the magnesium content, as irrigation produced 32 per cent and variety 25 per cent. Potassium was found to vary 51 per cent, 35 per cent, and 28 per cent respectively, due to variety, irrigation water and soil. The extreme variation of phosphorus content of wheat was over 300 per cent. Variation in phosphorus content was due to irrigation, soil, and variety. The Utah-grown grains showed a lower phosphorus-calcium ratio which the authors claim make such grains a more nearly balanced food. The sulphur content variations were found to be 48 per cent, 40 per cent, and 30 per cent respectively, due to irrigation water, variety and soil. Sulphur determinations were made by the moist-fusion method, which gives higher results than by ashing. The iron content variation was found to be markedly affected by irrigation water, variety and soil. The authors raise the question whether the factors they report would not materially modify the nutritive value of grains grown on such highly fertile calcareous soils.—J. E. Greaves and C. T. Hirst, *J. Nutrition*, 1: 293 (Mar.), 1929.

The Effect of the Cow's Ration on the Vitamin "D" Content of Milk—As a step in the study of the effect of the cow's ration on the food value of milk, the vitamin D or antirachitic potency of milk from cows on the high-and-low-protein experiment was determined. Since the vitamin C content of feeds used in grain mixtures is negligible, and since all the cows in the experiments received silage, the difference in the vitamin content of the milk was probably due to the kinds of hay used. The high protein and normal cows received alfalfa hay. The low protein cows received timothy hay. The low protein cows also received 1.5 lbs. of

molasses daily. It is concluded that milk from cows fed on a low protein ration that contained timothy hay was slightly more potent in vitamin D than milk from cows fed a high protein ration containing alfalfa hay. Whether this difference was due to the kind of roughage, the manner in which it was gathered and handled to the stage of maturity at which it was cut, or to the presence of molasses in the low protein ration, remains to be determined. The results obtained also indicate that cow's milk is a relatively poor source of the antirachitic factor, at least 23 c.c. of milk (0.8 gm. of butterfat) being required to allow practically normal bone formation in rats fed on a rickets producing basal ration.—W. E. Krauss, *Ohio Agri. Exper. Sta. Bull.*, 14: 57 (Mar.–Apr.), 1929.

The Relation of Soil Fertility to Vitamin "A" Content of Leaf Lettuce—The results reported herein bear upon the question of whether the vitamin A content of plant tissue varies with the conditions of soil nutrition which determine plant development with respect to size and robustness. Lettuce was grown on normal sandy loam soil, on this soil with added sheep manure and a mixture of KNO_3, $CaH_2(PO_4)$ and KCl, and on the same soil with the inorganic fertilizer without the organic manure. This latter lot grew most profusely and with the greatest vigor. Furthermore, the lettuce grown with the inorganic fertilizer only was the greenest of the three lots. Rats were depleted of their store of vitamin A, and when definite losses of fat or xerophthalmia occurred, the rats were fed daily 0.2 gm. of lettuce grown on each type of soil. The animals fed on lettuce raised on the soil treated only with the inorganic fertilizer grew at the most rapid rate and made the greatest gain during the experimental period of 8 weeks. The growth curve for the rats fed lettuce grown with inorganic and organic fertilizer was always below that of the rats fed lettuce grown with inorganic fertilizer only. The rats fed lettuce grown on soil without fertilizer grew more slowly than those in the other two groups. Differences in the growth of the animals on the three grades of lettuce are not explainable through variation in the relative quantities of the chemical elements present. It is concluded that vitamin A content varied with plant vigor and robustness. The variations in vitamin A content of the plants were likewise associated with the degrees of greenness, and not necessarily with vigor apart from differences in chlorophyll.—Marie Dye and John W. Crist, *J. Nutrition*, 1: 335 (Mar.), 1929.

Manganese in Cereals and Cereal Mill Products—The object of the work reported was to study the variation in the manganese content of cereals of several varieties and of some of their extraction products in relation to ash and protein content. Five varieties of each of the cereals were used as follows: hard winter wheat, soft winter wheat, red spring wheat, white spring wheat, rye, corn, rice, oats, and barley. Similar determinations were made on some of their extraction products. No correlation was found between manganese and the ash content of any of the varieties examined. Neither was there any correlation found between manganese and protein except when the types of wheat were used collectively. In that case, the relation was inverse, the hard winter and the red spring wheats being higher in protein and lower in manganese than the two types of soft wheat.

It is of interest to note that the manganese content of Red Rustproof oats grown in Arlington, at the Experimental Farm of the Department of Agriculture, was found to be several

times higher than that of other varieties of oats studied.

No distinct correlation was established between the manganese content and the protein content of the cereal products, with the exception of the milling products of wheat. The products having a low ash content had a low manganese content, both being due to the low degrees of extraction. A comparison of the manganese content with the diastatic properties of the cereals used in this investigation failed to show any correlation between them. The author further observes that corn and uncoated rice, which are associated with nutritional deficiency diseases, were both low in manganese.—Jehiel Davidson, *Cereal Chem.*, VI: 128 (Mar.), 1929.

The Phosphorus of Grains—It has been shown that the phosphorus content of wheat, oats, and barley is increased as irrigation water is applied. In order to throw some light on whether the increase represents organic or inorganic phosphorus, quantitative determinations have been carried out of the total and inorganic phosphorus. Determinations made on wheat, oats, and barley, in which increasing applications of irrigation water were applied during the growing stage, showed relative increases of total phosphorus. Wheat showed a maximum total phosphorus increase when 35 inches of irrigation water was used. At 67.5 inches, a decrease was observed. Practically all of the increase is in the form of organic phosphorus. Corn showed little increase when irrigation was applied. The increase observed in corn was in the form of inorganic phosphorus. The increase of inorganic phosphorus in corn was shown to be due to the use of varying amounts of farm manure. Samples of grain collected from various sections of the State of Utah, where this work was done, showed a wide variation in the phosphorus content. It was concluded that irrigation, soil, and possibly climatic conditions, all influence the total phosphorus content. It was further concluded that there was no direct relation between the total and inorganic content of the grains studied. The average inorganic phosphorus as compared to total phosphorus in wheat was 6.5 per cent, in oats 9.8 per cent, and in barley 9.6 per cent.—J. E. Greaves and C. T. Hirst, *Cereal Chem.*, 6: 115 (Mar.), 1929.

Chemical Composition of Mustard and Turnip Greens and Losses of Iron in Cooking—Data are presented on the chemical composition, including ash, calcium, phosphorus, and iron, of turnip greens, mustard greens, and spinach, and on the losses of iron in cooking turnip and mustard greens in various ways. The method used for the iron determinations was moist oxidation followed by calorimetric estimation with thiocyanate, the technic including certain modifications of variations in the method reported in the literature. A comparison of the data for turnip and mustard greens with similar data for spinach showed that both vegetables compared favorably with spinach in all respects and were markedly higher in calcium and iron. When cooked in varying quantities of distilled water for 45 minutes, the losses in iron varied from 5 to 25 per cent, depending upon the volume of water used. Tap water (the city supply of Nashville, Tenn.) caused more than twice as great a loss of iron as was caused by an equal volume of distilled water.—A. M. Field, M. T. Peacock, E. Cox, and I. P. Earle, *West. Hosp. & Nurses' Rev.*, 11, 5: 26–28, 1928. Abstr. *Exper. Sta. Rec.*, 60: 190 (Feb.), 1929.

CHILD HYGIENE

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PHYSICAL DEFECTS

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WHEN is departure from absolutely normal structure or function a real "physical defect," and what are the signs or symptoms by which such defects may be recognized and properly referred to the most helpful professional person for advice and treatment? The answer to this question is not so simple as it might at first appear to be. Physical defects are not merely anatomical variations, but often are intimately related to function, and at times vary in degree with environmental conditions. Physical defects are of two major types:

a. Those which are dynamic in character and produce demonstrable effects in a short time

b. Those which might be regarded as potential "threats" to an individual's health or longevity

Much of the disagreement in professional advice between physicians is centered on these potential "threats" rather than on the dynamic type of defect. Also, a great deal of lost effort, time and money are closely associated with "follow-up" on the part of the nurses to get these "threats" removed or corrected and to persuade reluctant parents to have something done for them, where the parent remains unconvinced of the value of the procedure being recommended. With a limited budget and personnel would it not be more economical and effective to concentrate upon the most urgent defects, merely notifying parents of the others, until the more urgent corrections have been made?

The greatest need in our efforts to restore and promote health, is more *facts* and less opinions on this subject. This necessitates the development of more instruments of precision, which, placed in the hands of easily trained technicians, will furnish data that are objective, reliable and valid. These data must then be handled in an accurate and sound statistical manner and the interpretation of the findings must be made by one who has sufficient background of training and experience, to determine best its real significance and the most effective methods of practical application.

Many records of "defects" today are worthless since many of these records represent only the opinion held at the time of examination, and by the individual examiner.

The opinion of the same examiner, on the same case, is in certain types of defects, such as tonsils, not always constant, and opinions of different examiners on the same case when independently formed, even after examinations made in the same hour, not infrequently differ markedly.

These statements are not intended as caustic criticisms of the examiner's individual ability, but a frank recognition of our present-day limitations. This fact most physicians unhesitatingly recognize. Some less competent au-

thorities still dogmatically declare their ability to differentiate and interpret the signs and symptoms of "abnormality" in many of the border-line cases in which physicians realize their present-day limitations. Anyone can detect extreme cases of defective structure and function, but for such advanced cases little can usually be done; therefore it is desirable to direct our efforts toward preventing defects and toward their early discovery and treatment because:

1. Physical defects tend usually to become worse.
2. Physical defects tend to produce secondary defects.
3. Physical defects tend in time to become irremediable.

What are the more commonly seen physical defects and how may they be detected in order to prevent them from doing the greatest harm to the individual?

Vision and Hearing—Under our modern conditions, especially in our crowded and bustling cities, we find in the younger children defects of vision and hearing. These are not infrequently directly related to disease, such as acute contagious diseases of childhood, local infections, and general infections of the blood and lymph—syphilis and tuberculosis.

Tonsils and Adenoids—Infections of the adenoid tissue of the nose and throat are not always easy to detect in the earliest stages, and there the germs frequently remain latent in the tissues and establish laboratories whose products may sooner or later become absorbed into the blood and insidiously attack other distant parts of the body, at times when resistance is lowered by such agencies as cold, fatigue, undernourishment, and so forth. Not only do the nose and throat offer all the favorable conditions for bacterial growth (warmth, moisture, darkness, and "food"), but the engorgement of the erectile tissue of the nares obstructs breathing; interferes with aeration and purification of the blood; and closes the natural draining passages for the constantly secreted mucus of the pharynx.

This mucus, under such circumstances, is often dammed back into the Eustachian tube and produces abscess of the ear, with impairment of hearing; and also makes possible mastoid infection and meningitis as secondary effects. These complications can in many cases be avoided by early treatment of the original nose or throat infection.

Glandular Enlargements—Enlargement of the glands of the neck may be either a physiological defense against, or the direct result of, disease. This differentiation can only be determined after a careful study of the individual case by a competent physician. The thyroid gland is often enlarged as a result of simple iodine deficiency. The thymus gland, which ceases to function ordinarily in early life, occasionally persists later than usual and causes some difficulty. The lymph glands of the neck filter out poisons elaborated at points of local infection and thereby aid in preventing "blood-poisoning" or general infection. The treatment in such cases is directed to the source of infection rather than to the glands themselves, though the glands may in some cases require attention.

Skin—The skin has many different types of disease which attack it in various individuals. Local conditions often require general treatment as well as local applications and these diseases may be contagious or not. The distinction should be determined early, both for the sake of the patient and of those with whom he may come in contact. Before destroying the characteristic appearance of the lesions, by ill-advised efforts at home treatment, it is advisable to consult the physician early, so that he may see the evidence uncomplicated by such efforts. Time and money are usually saved by this plan.

Teeth—The prevention of dental caries is an urgent problem and one which we have not as yet fully solved. What relation does this condition bear to tooth brushing, diet, mouth acidity, bacterial action, proper mastication, pits and fissures, poor occlusion, heredity, or to mineral deficiency of the blood stream and the many other suggested causes? I feel that we are far from agreed at this time upon this point. It seems quite evident that filling of the cavities retards the process of dental decay, and surely clean teeth do improve one's appearance. It appears to be justifiable to clean the teeth regularly and to have cavities filled by the dentist.

Dental caries has been described by Sir William Osler as "our most prevalent disease," and statistics amply confirm this statement. Further research is greatly needed upon this subject.

Lungs—Lung conditions or diseases are most usually centered about tuberculosis and the pneumonias. These conditions can often be diagnosed early by the physician only after the most careful individual examination with laboratory and X-ray aids. Such examinations require skill and a private, quiet place for the examination.

Heart—Defects and diseases of the heart restrict the activities of the individual in varying degrees. These restrictions can only be determined by careful study and experimentation by the patient and his physician. Each person appears to have his individual circle of permitted activity, even in health, but especially in heart afflictions.

Cardiac cases in school children in many instances are benefitted by special class programs arranged by the teacher and doctor in coöperation. Shorter hours, no stair climbing, avoidance of crowds, and, above all else, frequent reëxaminations and supervision by the doctor are essential.

Bones—Infections of the bones and joints require expert study and diagnosis before treatment can be considered. Efforts not preceded by, and founded upon, a careful medical examination are ill advised.

Orthopedic Cases—There is grave danger in many of the efforts made to conduct "corrective gymnastic" classes where no careful medical examination and treatment outline has been given by an orthopedic physician. Most deformities, such as flat-feet, bowlegs, etc., involve muscle, ligaments, and nerves as well as the bones, and the coördinating mechanism is complicated and not easily understood or appreciated.

Nervous Diseases—Diseases of the nervous system must be carefully distinguished from the emotional lack of control which is so often called "nervousness" and which is seen in the so-called spoiled child, or, as many now refer to it, the unadjusted child. Many of these children appear to respond rapidly to the adjustment of the parent, or of the individual having charge of the child. Emotionally unstable and untrained nurse-maids are at times big factors in these cases.

Cripples—In considering the crippled child we have usually to deal with a combination of defects of the muscular, bony and nervous systems, and in a certain percentage of these cases the mentality is also affected by the underlying causative factor or factors.

The major school problems in cases of crippled children where the mentality is not involved are as follows:

1. The determination as to whether the disease is of a "progressive" nature or is "arrested"
2. The problem of transportation to and from the school
3. The problem of providing the greatest comfort to the child while in the school, in order to conserve his lowered vitality, so he may use it most profitably. (Special furniture is usually required for bad deformities.)

Malnutrition—Here is a much discussed and often abused subject. It is an arbitrary and inclusive term rather than a definite entity and, therefore, must be clearly defined by each one who discusses this subject. Too often the food aspect alone is considered. There are other factors of equal importance to be considered, such as the transportation of the food through the digestive tract and the absorption and assimilation of food, which takes place at various points along the way. Then there is the important function of waste elimination.

All of the bodily processes are affected in varying degree by the emotions and these are far from standardized in different persons. One should study carefully the factors involved and the part played by each. The digestive tube, of which the stomach is but a dilated portion, or storehouse, is composed, to the extent of three-fourths of its bulk, of muscle. This muscle along with other muscle suffers from bodily fatigue or weakness, and cannot in such a state push along the food in the digestive tube at the usual rate to the sites where the specialized digestive functions are located; and so the digestive process is thrown out of gear by the element of fatigue. This factor is an extremely important one in childhood and in adolescence. "Fashion" plays a large part in the adolescent age. Many of the cases of fainting and apparent ennui are due to weakness, which is in turn due to extreme dieting carried on in an ill-advised endeavor to attain the slender figure that, I am happy to be informed, is not to be "the mode" any longer.

Hernia—the escape of the gut through the body wall into a sac of tissues pushed ahead of it—usually occurs at special areas which are inherently weak from the time of birth. Hernia occurs directly as a result of increased intra-abdominal pressure, usually caused by muscular strain induced by heavy lifting or prolonged and strenuous coughing, such as occurs in the paroxysms of whooping cough.

The detection of physical defects in their early stages is distinctly a medical man's problem. There are devices now available, and we hope that more will become available in the near future, which will enable nurses, and others perhaps, to detect suspicious signs early, and send the child at this time to the physician for proper study, diagnosis and treatment. Among such helpful devices we might mention the thermometer, the eye-test charts, the audiometer and other hearing test devices, the scales and measuring devices. These devices and the physician's judgment are at present our final criterion, and will probably remain such, since the up-to-date physician always takes advantage of all improvements in instruments of precision which actually aid in the determination of facts upon which to base his opinion and treatment.

Treatment is wholly a problem within the domain of private and hospital medical practice.

Prevention of physical defects, in so far as our limited knowledge goes, is dependent upon nature and nurture. Healthy living is intimately concerned with:

1. Proper foods with regular elimination of waste
2. "Rest-exercise balance," which, of course, includes sleep
3. Cleanliness of body, mind and soul, which are closely correlated
4. Preservation of body against injury through "safety first" observances
5. Recreation of proper kind and amount for the individual
6. Periodic medical and dental examinations to detect latent "threats" or early involvements before they produce symptoms recognized by the patient
7. Early medical attention to suspicious signs of departure from the normal condition of the individual child—the so-called "droopy

stage," which the mother often detects more readily than the physician, because of her knowledge of the characteristic "normal" appearance and activities of the individual concerned

These suspicious signs include in the earliest stages nothing definitely definable because they are merely the absence of usual characteristic appearance and actions of the individual child. These indications are usually later followed by definite signs and symptoms, such as fever, rash, inflamed or watery eyes, sniffling or mouth breathing as before a cold, discomfort or even pain, diarrhea or constipation, earache, etc.

Of course, chronic eyestrain, squint or frequent headaches at the end of the day, defective hearing, or discharge from the ear, mouth breathing, or frequent sore throat or joint pains, poor nutrition, fatigue from which recovery is not rapid nor complete, shortness of breath, unusual swellings, "limp" or apparent deformity, decayed teeth, skin lesions, all suggest the need of medical attention.

Convalescence from the acute contagious diseases should be adequately prolonged to prevent complications such as those mentioned, and also improvement of heart, kidney, lung, bone, joint and nervous system.

SPECIFIC PREVENTIVE MEASURES

Eyes:

Proper lighting—avoidance of shadows or glare.

Occasional looking at distant objects to relieve the muscular contraction by which accommodation for near objects is obtained. Headaches often result from muscular spasm or "cramps" produced by prolonged close accommodation, particularly where lens defects exist.

Correction of certain visual errors by glasses, when these are suggested by squint, redness or frequent "watering" of the eye, headaches or blurring of the image, and the oculist discovers defects.

Ears:

Ear conditions are commonly secondary to nose and throat troubles, such as nasal obstruction or infections, especially following the acute contagious diseases, commonly involving the accessory sinuses, but may occasionally come independently.

Malnutrition:

Proper quantity and quality of food (selection, combination, preparation, digestion and assimilation).

Correction of interfering physical defects; discovery and elimination of foci of infection; and the avoidance of fads and food cults or doctrines founded upon dangerous half-truths, which are often worse than untruths, and more difficult to combat.

Proper hygienic habits affecting the individual concerned.

Hernia:

Careful medical examination will aid in determining whether the usual sites for hernia are inherently weak in the individual case. Especial care should be exercised, when such conditions exist, to avoid undue physical strains which produce muscular contractions and raise intra-abdominal pressure. Special supports may be worn when indicated to lessen the danger of rupture.

Bony Deformities:

These are sometimes due to faulty diet. In such cases the diet can be corrected before the deformities appear, as in rickets. "Safety-first" is always a good rule to follow, and many needless hazards can be eliminated by protective devices in sports and industry.

Physical defects can be minimized by ordinary care and the practice of the habits of right living. Periodic health examination by a physician is the best safeguard to health.

"Have a Health Examination on your Birthday."

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Purposeful Publicity—Appraisal forms of one kind or another are finding their way into many organizations. Self-analysis is increasing in popularity, and is the "tape measure of utility" these days. The Community Health Association of Boston chose a play as the medium of appraising its own family health work, and presented it to interested audiences as a method of publicity.

The Clark family was one which the Community Health workers had actually visited over a period of more than 2 years. A flimsy excuse brought the nurse on the first occasion, but the so-called unnecessary or unsatisfactory visit led to much greater consequences.

A series of ups and downs in the Clark family motivated the little drama with more than usual success. A new outlook on life, wholesome, nourishing food, and a way to live within their means, brought about an evolution from the border-line of disaster to a position of health and happiness. Just an ordinary family with the usual assets weighed against the usual liabilities—but, by means of wise guidance and thoughtful consideration, the realization of health teaching was grasped, and the Clarks became a "prize family." The play was given for the first time to the senior students of three large schools of nursing in Boston, to show them what good public health nursing is and how satisfactory it really can be, and to enlist their interest in it.

The second audience was composed of board members, theoretically well grounded in the work the nurses are doing in the homes. The play gave them an actual picture of the approach to the home, the kind of service given, and the result of repeated application of health teaching.

The third presentation was for the staff nurses, as a means of stimulating them to have faith in their efforts, by seeing the complete piece of health work of which they are only a part. So often a nurse remains in one locality too short a time to see tangible results of her efforts, or she becomes so lost in the details of the work that she loses sight of the breadth of her own accomplishments.

Twenty Aids to Mental Health for Adults—Go into any book shop these days and you will find arranged on the shelves, on the non-fiction side of the room, numerous volumes dealing with psychology for normal people. Many of these books will be read. Others could be read to advantage, but limited time and inclination are the decisive factors in the selection of reading material for the average individual.

Adults need mental health. Each one of us is vastly interested in his own mental status, but he may be absorbed in the problem from an entirely wrong standpoint, and for this reason may need wise guidance more than a person who is entirely unconscious that there is such a thing as mental health.

Dr. Henry B. Elkind, Director of the Massachusetts Society for Mental Hygiene, has prepared a leaflet, *Twenty Aids to Mental Health for Adults,* which is arresting because of its simplicity and brevity. Each short paragraph is packed with good sound prac-

tical advice—just the things which public health nurses need on so many occasions—and the whole is an appeal to common sense. Copies may be obtained from the Massachusetts Society for Mental Hygiene, 5 Joy Street, Boston, Mass.

The Dairy Counciler—The National Dairy Council, 307 Michigan Avenue, Chicago, Ill., is publishing in 6 issues annually a bulletin known as *The Dairy Counciler*. The first issue appeared in April, 1929.

Judging by the contents, the purpose of the bulletin is to keep organizations posted on the new material offered by the council. Practical suggestions for health programs and general information regarding the National Dairy Council are other features of the first number.

The League Celebrates a Birthday—The League of Red Cross Societies was 10 years old on May 5, 1929. To celebrate this event, a special League Anniversary number of the Red Cross Courier is devoted to the work and achievements of the League during the first decade of its existence.

Red Cross Work for War Veterans—The Red Cross has assumed two definite obligations, one of which is the service to the war-disabled veteran, and the other the preparation for disaster relief.

The magnitude of the former feature of Red Cross endeavor is impressed upon us, when we know that 56,500 cases were handled monthly during the fiscal year, which ended June 30, 1928.

Veterans are aided in the preparation and presentation of claims, and given temporary relief, if necessary, pending the judicial decision of the claim by the government.

A Rise in the Protein Stock Market—In an address before the New York Association of Dietitians, E. F. DuBois expressed the opinion that more attention will be paid to the dangers of partial protein starvation in chronic diseases. Many clinicians are still restricting the protein diet in nearly all patients supposed to have high blood pressure or nephritis, because the excretory organs are considered impaired and should not be overtaxed.

Today, there are instances in certain types of nephritis where good gains have followed a liberal protein intake. When patients have a heightened metabolism, it is easy to deplete the body in respect to protein, if the diet is poor in that foodstuff.—The Control of Protein in the Diet, Current Comment, *J. A. M. A.*, 91, 24: 1897 (Dec. 15), 1928.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

For Expositions and Fairs—Two much used—and still useful—stunts for county fair and exposition exhibits may yet be secured in mimeographed form from the Tuberculosis and Public Health Committee of the State Charities Aid Association, 105 East 22d Street, New York, N. Y. Copies of "Tommy Don't Care and Tommy Docare" or "Health Fortune Teller" will be sent for 10 cents each.

Shall We Pay for Radio Time?—A health officer writes:

I have a limited amount of money for publicity purposes and the question is whether to use it on a bulletin or use radio broadcasting. We have an excellent local radio station which has given us a very low rate for use each day, and I have almost come to the conclusion that this form of publicity would be of greater advantage to the public health work of this community.

One reply to this letter was:

It would be quite unusual for a department or other health agency to pay for radio time. If you pay for radio time the newspapers may well ask you to pay for all space they give you.

So it would seem better to spend your funds—you do not say how much—on a regular bulletin or house organ, or for the preparation of good copy for newspaper use. Either method would promise to cover your city more fully than could be possible by radio. If you issue a bulletin you would issue 6,000 to 8,000 to cover the city.

The two newspapers, with their combined daily circulation of 25,000 and over, would doubtless welcome your copy if it is put up as good as should be the case of radio talks. In connection with the newspapers you would spend your available funds for the part-time of some one to write the copy from material you would supply.

If you use the radio, I wonder if it would be worth while to try for time every day—it depends partly upon the length of each period, the hour, and especially upon your ability to produce material of enough attractiveness in subject and form to lead enough people every day to listen in—poorly done radio talks may do as much harm as good.

Texas Better Health Special—

For several years the Missouri Pacific Railroad has operated health cars in certain sections of Missouri and Arkansas, but the Texas Health Special was an entire train made up of two exhibit cars, two lecture cars, baggage car, diner and Pullman. Besides the train crew there was usually a personnel of 12 or 15 trained physicians, sanitary engineers and technicians. The railroad was invited by Governor Dan Moody and Dr. J. C. Anderson, State Health Officer, to bring the train to Texas. . . .

The first car contained models and exhibits pertaining to general sanitation most needed in the South, particular attention being given to models showing the proper kind of screens for houses, mosquito control work, models of fly-proof toilets, construction of wells, sewage disposal, garbage disposal, rodent control, etc. Then came a lecture car in which public lectures were given by specialists in the different departments of sanitation shown in the exhibits.

The next car was also a lecture car, in which general topics of disease prevention and safety were discussed and illustrated by charts, delineascopes and films. In the fourth car was a model of a complete dairy farm and a milk plant with a miniature pasteurizing plant in operation. . . .

The train traveled more than 2,500 miles and visited 115 towns and cities. Seventy thousand people were shown through the train and listened to the lectures.—

Hygeia, July, 1928.

EDUCATIONAL MATERIAL

"Announcing a New Service for Teachers" is an 8-page booklet concerning speakers, demonstrations, class-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

room helps, plays, and posters supplied by Dairymen's League Coöperative Association, 11 West 42d St., New York, N. Y. *Copy free.*

"First Aid for the Mentally Sick," by New York State Committee on Mental Hygiene, 105 East 22d St., New York, N. Y., describes "the provision made for the emergency care of mental patients"—the "wrong way" as is common in New York State and other states—and the "right way." *Free.*

"Health—Diseases, Drugs and Sanitation," list of United States Government publications now on sale. Revised. Superintendent of Documents, Washington, D. C. *Free.*

"How to Use a Good Refrigerator," by M. E. Pennington. National Association of Ice Industries, 163 West Washington St., Chicago, Ill. *Free.*

"Old Mother Hubbard and Her New Cupboard" contains 50 well written articles on "nutrition with special emphasis on the problem of child feeding." Good paper of a weight to give the pamphlet permanency. The 6-point type is small, but is helped out by the leading and good press work on good paper. Writing above the average, with a number of teasing titles: "Grown-Ups on the Milk Wagon," "He Eats Like a Man," "The Master Clock," "Fit for a King," "The Golden Egg," "Straight as an Arrow," etc. *It has a table of contents.* The articles, one to a page, run about 300 words, and were published weekly by 50 newspapers in Los Angeles County, Calif. Written by Rama V. Bennett, nutritionist of Los Angeles County Public Health Association, and issued jointly by the association and the County Department of Health. *Send 50 cents to the department for a copy.* Should be usable in other counties in other states. Copyrighted but doubtless permission to use would be granted.

"One out of every two workmen cannot see clearly what he is doing," a 5-page press release by L. H. Carris, National Society for the Prevention of Blindness, 370 7th Ave., New York, N. Y. For speakers and house organs. *Free.*

"Tuberculosis: The Maker of Orphans," including "Winning—But Not Won!"—Tuberculosis Society, Racine, Wis. *2 cents.*

The two following are from the Metropolitan Life Insurance Company, 1 Madison Ave., New York, N. Y.: "Forethought the price of life," a 4-page folder on medical examinations; and "Health, Happiness and Long Life." 22 pages. Elements of health. Limited text.

Both the above have a little too much color and too much ornamental detail to encourage concentration.

The three following are from American Institute of Baking, Chicago (*Free*): "Answering Bread Criticisms," by Roscoe H. Shaw. 8 pp.; "The Bread of Life," by E. V. McCollum. 12 pp.; and "Facts About Bread."

DIPHTHERIA

The Metropolitan Life Insurance Company has prepared a diphtheria car card, a reproduction of the New York State prize winning poster. *Free.*

A 32-sheet billboard reproduction of the prize poster is sold by the State Charities Aid Association, 105 East 22d St., New York, N. Y. *50 cents.*

"What a *Whale* of a difference a little *Health* makes," Health Council, Electric Building, Cleveland, O.—a 4-page, 6″ by 9″ folder with distinctive illustrated cover page. Appeal to "be wise—immunize," and how "Cleveland Fights Diphtheria." *4 cents.*

Tabloids for diphtheria! That's the new prescription in the home city of the Schick test! Pardon the near-tab language, for the Diphtheria Prevention Commission of the New York City Department of Health has gone into tabloids in a big way. It started with

a 4-page tabloid newspaper for Brooklyn which centered around Boy Scout coöperation in the anti-diphtheria campaign. Then Bellevue-Yorkville's *Health News* evolved into true tabloid style which can be appreciated only when seen. Jean Henry is Tab Editor for the Commission, with Marjorie Dent Candee as Bellevue-Yorkville Editor. Harlem (negro) and Bowling Green editions have been issued by the Commission.

In strong contrast with the above is the altogether dignified 9″ by 6″ card for the doctor's office which has been mailed to all practicing physicians in the city.

The card is of heavy beveled board with the lettering in white on a soil-proof brown background and bears in gold the seals of the City and of the County Medical Society. There is space for the doctor's signature.

A device on the back makes it easy to hang on the wall, or to stand on a table or mantelpiece. The wording seems to be successful in providing a card unobjectionable to physicians, and appropriate even for those specialists whose work lies outside of the field of child care.

Four million small folders will be distributed through the mail by the electric and gas companies. An elaborate diphtheria handbook is about to be issued. An illustrated catalog of publications will be supplied upon request to Diphtheria Prevention Commission, Department of Health, New York, N. Y.

HONORABLE MENTION

To Public Health Federation, Cincinnati, O.: for having a full table of contents in *A Survey of Community Dental Facilities*, and for having a brief bibliography in the same report (even though several of the references are too incomplete for ready use).

To the Milbank Memorial Fund, 49 Wall St., New York, N. Y.: in its 1927 annual report—for the effective presentation of professional activities through text, diagrams, tables and illustrations. It is disappointing to note the lack of an index so that, for example, health education must be searched for under such general headings as "Other Activities" or "Special Health Activities." Closer relations between the beautifully produced illustrations and the captions under several of them would be more satisfactory to some readers; and the addition of office addresses to the pages of operating and supervising organizations would be helpful.

To State Charities Aid Association, New York, N. Y.: For "Milestone 55," annual report, with table of contents and other features.

To State Tuberculosis Commission of Connecticut: For a 1926–1928 report using paper for the cover which makes a public document almost attractive; for numerous page half-tones; for partial table of contents.

MOTION PICTURES

The amateur movie clubs, already existing in some high schools and colleges, and many in cities outside of schools, might be enlisted in health scenarios. At least the school audiences would be reached at a moderate expense for materials supplied.

"Speaking the Motion Picture's Language." *The Motion Picture*, 469 Fifth Ave., New York, N. Y. Vol. 4, No. 12. *Free.* Glossary of slang or "technical phrases."

RADIO

"Curtailment of abuses in the radio broadcasting of medical advertising is likely to follow the adoption of a code now under consideration by the National Association of Radio Broadcasters and the Better Business Bureaus, according to a recent editorial in the *Journal of the American Medical As-*

sociation," says *Editor and Publisher,* which calls attention to the need of control and quotes liberally from the *Journal* editorial.

Every weekday the New York City Y. M. C. A. conducts two radio periods, "Health Talk—Gym Class," 9:30 a.m., WOV, 265 M.–1,130 Kc.; and "Health and Happiness Exercises," 11:10 a.m., WGBS, 254 M.–1,180 Kc.

The *Journal of the A. M. A.* announces week by week two groups of broadcasts—at 10:00 a.m. and 8:00 p.m., Central time. Daily except Sunday. Station WBBM, 389.4 M.–770 Kc.

Health agencies having regular broadcasting periods are invited to report hours, stations, etc., for advance announcement.

How about getting local reports on health talks from different stations?

POSTERS

Three of the wood block posters of the Chicago Tuberculosis Institute were included in the Second Annual Exhibition of Chicago Fine Printing. The posters were entered by the Department of Printing Arts of the School of the Art Institute of Chicago.

A poster, 12″ by 19″, with portrait of "Lillian," who a "few months ago" was not the care-free, happy girl she appears in the picture, is a superior example of the community chest type of poster issued largely for display in factories and offices. The dull-finished India paper with brown ink suggests how some of our drab black and white posters might be improved. Community Fund, 51 West Warren St., Detroit, Mich. *4 cents.*

"Milking Time in Many Lands" is the title of companion posters, 42″ by 12″. Health Education Department, Dairymen's League Coöperative Association, 11 West 42d St., New York, N. Y. *Each 25 cents.* Each poster includes four panels headed "Peru-Lama," "Arabia-Camel," etc. Vivid colors with simple sketches from which much detail has been eliminated, with good lettering, make them strikingly good to look at and effective for the teacher or mother who wishes to talk about milk. Produced by a silk screen process which avoids the "prettiness" found in many posters. Planned by Louise Franklin Bache, publicity director of the National Probation Association, who is consultant in health education to the Dairymen's League.

"Safety Posters—1929," National Safety Council, 108 East Ohio St., Chicago, Ill. Illustrated catalogue of posters supplied to members. *Free.*

"Tests to Determine if Your Poster Is Effective." *Northwestern Health Journal,* 11 West Summit Ave., St. Paul, Minn., Feb., 1929. *10 cents.* Simple statement of important elements.

"Toy-making Turned to Gay Propaganda," *Survey Graphic,* Mar., 1929, describes and illustrates the group of felt posters produced in Italy for the National Dairy Council, 307 North Michigan Ave., Chicago, Ill., from whom the set may be borrowed. They illustrate a poster form in which some volunteers might become interested. In practice, for effective use, the amount of detail calls for a size two or three times as large as these gay specimens.

TELLING TITLES

"Are You a Dietary Diplomat?"—*Hygeia.* Young America's dietary likes and dislikes.

"Digger of Graves"—Racine, Wis., Board of Health. Press release on "when the spreader of 'colds' becomes socially unpopular, he will cease to be a public menace."

"Don't Be a Transmitter"—*Canadian Red Cross.* About colds.

"Must Mothers Die?"—*News Letter.* Dutchess County Public Health Association.

"What's Happened to the Stork?" *Bellevue-Yorkville Health News.* A paragraph on fewer births in the district.

BOOKS AND REPORTS

Manson's Tropical Diseases. A Manual of the Diseases of Warm Climates—*Edited by Philip H. Manson-Bahr. (9th ed. rev.) New York: Wood,* 1929. 921 pp., 401 figs. Price, $11.00.

A book which has reached its ninth edition has proved its value. In this latest, especial attention has been directed toward the treatment of tropical diseases, which is happily becoming stabilized and effective.

The subject matter has been brought up to date. The illustrations are abundant and excellent, the 23 color plates being especially good.

The work will continue to hold its place as a standard text and reference, and can be unhesitatingly recommended.

The make-up and printing are good.

M. P. RAVENEL

Comparative Neurology. A Manual and Text for the Study of the Nervous System of Vertebrates—*By James W. Papez. New York: Thomas Y. Crowell,* 1929. xxvi + 518 pp., 315 figs. Price, $6.00.

Biologists having to deal with the complex details of the vertebrate nervous system will find in the manual prepared by Professor Papez a very welcome addition to the literature of this highly specialized subject. It is divided into three sections: The first deals with the gross anatomy of the brain of mammals; the second with their microscopic structure; and the third with the nervous system of the lower vertebrates from the reptiles to the fishes. From the standpoint of comparative anatomy and of the logical development of the subject it would have been better to have progressed from the simpler organization found in the lower classes of the vertebrates to that of the more complex mammalian type. The book is founded upon a laboratory course in comparative neurology and is largely descriptive of laboratory and museum material with only occasional references to function until one reaches Chapter 33, on the physiology of the cerebral cortex.

The volume is splendidly illustrated with well executed figures of the complex structures, very fully but uniformly and simply labelled, so that the reader may know at once the nomenclature of the salient features of any of the many illustrations. This feature alone places the book in a unique position among neurological works. A large proportion of the illustrations are new and the range of sources is a wide one. An abbreviated bibliography is given at the end of each chapter. The book is an excellent laboratory manual and a very convenient work of reference.

C. A. KOFOID

Improvised Equipment in the Home Care of the Sick—*By Lyla M. Olson, R.N. Philadelphia: Saunders,* 1928. 109 pp. Price, $1.25.

Miss Olson's little handbook points away from the complexities and extravagances of present-day equipment in the care of the sick in home and hospital. It shows with interesting illustrations and clear explanations that the art of improvising the necessities and comforts of the sick room may be revived. It points out the opportunity that the Nurses' Training Schools have in fitting the student nurses to care for the sick in all walks of life. We are reminded that the large majority of patients with

whom the nurses will come in contact, either as private duty or public health nurses, need and would welcome a return to simplicity in home care of the sick. Every nurse in practice will find the book full of practical suggestions.

HARMINA STOKES

Parents and Children—*By Ernest R. Groves and Gladys Hoagland Groves. Philadelphia: Lippincott,* 1928. 196 pp. Price, $2.00.

This personable third of the Groves' brain children is built along the authors' characteristic style and should be as popular as its predecessors. In a field teeming with daring and unfeeling exploiters, these authors stand out for their sound psychology and their sympathetic and constructive treatment of family relationships.

Until educational institutions pay more attention to that mysterious thing, eugenics, parents will have to depend upon these and other sound authors for their help on family relationships. The sad part of it is that so many parents turn to the bizarre authors who give them more of a thrill for their money—and then they wonder why the magic tricks will not work.

The Groveses do not necessarily furnish a technic of family relationships. I should claim for them that they do give the parent sound basic material. Then let the parent think in terms of his or her own situation.

This particular book is a collection of articles which have appeared in various parental, religious, and educational magazines. The illustrations are of the usual type which appeals to parents—babies, dogs, adults holding young children, etc.—all with intriguing titles, such as "Pals" and "Life's a Joke." Chapter titles include, "Inside Tips for Fathers," "The Emotional Life of the Child," "What to Tell Children About Death," and "The Dangerous Mother." In the Appendix are questions and references which make the book easier for use in child study classes, which are a bit messy unless carefully conducted.

Parental education is in the formative stage and is, for the most part, theory. But in various laboratories, this new and wonderful social contribution is being developed, and since the movement is supported liberally by far seeing benefactors, we may rest assured that better parents are not only a possibility but a certainty. One has only to study the impressive work of such groups as the Institute of Child Welfare Research at Teachers College to see these theories in action with small groups of parents, and then one wishes that a greater number of parents could have such opportunities. But for the present, most parents must depend on the Groveses and other sound and pleasing writers for their meager share of a great benefit. But better times are coming—better times and better and happier families.

HUGH GRANT ROWELL

Healthy Growth. A Study of the Relation between the Mental and Physical Development of Adolescent Boys in a Public Day School—*By Alfred A. Mumford, M.D. New York: Oxford University Press,* 1927. 348 pp. Price, $5.00.

This excellent study attempts to show what relationship exists between mental achievements and physical development. It contains a large number of references to basic scientific studies in physiology and the physiology of exercise, with brief digests of the essentials of such studies.

It attempts to trace the relation between types of physique, and physiological and physical qualities, to mental attainments and school progress. Such factors as electrical resistance of the skin, and oxygen consumption, to mental activity, and of mental activity to physical development are discussed.

Figures on absolute growth of school

boys are given, and there are studies of the relative growth of these boys in such factors as height, weight, chest girth, and vital capacity. The buoyancy index is measured. A study of stamina, its evidences, relation to age periods, and tests for it, is included.

There is also a most interesting chapter on the ailing child, and the relation of health to mental attitudes and to the physiological and physical characteristics.

This is an excellent treatise for educators and physicians who are engaged in work among adolescents. It merits particular study by physical educators and by those responsible for competitive athletic efforts. CHARLES H. KEENE

Bacteriology. **A Text-book of Microörganisms**—*By Fred Wilbur Tanner. New York: Wiley,* 1928. 548 pp. Price, $4.50.

This book is designed for those entering on the study of microbiology. The author has selected students as his critics rather than those whose experience entitles them to form opinions. If he can be satisfied with this, we wish him happiness.

While there is useful information in the book, much space is given to material the value of which is more than questionable. For example, 60 pages are given to nomenclature and classification of bacteria, though the author recognizes that no satisfactory classification has yet been made. When those who are best fitted to do such work acknowledge the difficulties, and cannot agree among themselves, it hardly seems worth while to burden the minds of beginning students with such discussions.

There are many mistakes which could have been avoided by reference to any standard text, though teachers should always, when possible, consult original sources. As examples: Koch is said to have discovered the anthrax bacillus in 1876, though it was seen in 1849, again in 1850, cultured in 1860, and its etiological relation to the disease shown in 1863; the discovery of the diplococcus of pneumonia is credited to Weichselbaum in 1886, though it was described by Pasteur in France, and Sternberg in the United States in 1880; the discovery of the tubercle bacillus is given as 1884 instead of 1882; the use of anthrax vaccine is said to have "started a method of combating disease," though later in the same paragraph it is shown that the discovery of bacterial vaccines began with chicken cholera.

The English is frequently very poor. Some definitions in the glossary are not only wrong, but absurd.

It is a pity that this book will be used by many whose subsequent training will not correct the misinformation given. We regret that the publishers, whose name has long stood as a synonym for scientific exactness, have put out a book with so many inaccuracies and deficiencies. M. P. RAVENEL

Handbook of Bacteriology—*By Joseph W. Bigger, M.D., Sc.D. (2d ed.) New York: Wood,* 1929. 452 pp. Price, $5.00.

The favorable impression made by the first edition of this book is sustained by the second. It is still a readable and succinct guide for the student.

A few criticisms may be made, most of them concerning omissions rather than errors. The average American would not be willing to make Loeffler's blood serum by the old fashioned method described—2 hours for hardening, and 3 days for sterilization. The autoclave method in which both are done in one operation is used in this country.

The Widal test is described only for serum, and 20 minutes at 37° C. is allowed before examination. The use of dried blood is not mentioned.

The preparation of antigen for the Wassermann reaction omits many of

the safeguards generally employed in this country. We are advised to take a "fresh, healthy human heart" (where can this be had except in Chicago?), grind and extract with absolute alcohol, filter, and to 3 parts add 2 parts of a 1 per cent solution of cholesterin, and 70 parts of saline, giving a "turbid suspension," which is used. Apparently no test of any kind is made. There is no mention of icebox fixation.

The author has apparently never heard of the great improvement made in antianthrax serum in America by the use of spore vaccines, as he states that the most successful is that of Sclavo, made in asses.

The illustrations and printing are good, and for the purposes for which the book is designed, it can be heartily commended. Though printed in Great Britain, it is on excessively heavy paper.

M. P. RAVENEL

Public Health and Hygiene—*By Charles Frederick Bolduan, M.D. Philadelphia: Saunders,* 1929. Price, $2.75.

The author has had a wide experience in public health work, administrative as well as teaching. He has given us a manual for students which covers the ground well, is up-to-date, and in general correct. He is a believer in the historical method of teaching, and begins with a chapter devoted to history. We regret that he continues the fallacy of crediting Morton with the introduction of ether anesthesia, and Warren with having performed the first operation under ether, both being due to Long of Georgia, who removed a tumor under ether anesthesia in 1842, while the operation by Warren was done in 1846. Some other historical inaccuracies are noted, though they are chiefly omissions, probably due to the small size of the book, rather than errors.

The book is well printed, and the colored illustrations are excellent. Most of those in black and white are only fair, and some poor, showing signs of old age.

The book is much better than the average of its type, and can be commended in the field for which the author has designed it.

M. P. RAVENEL

Die Ernährung. Ausstellung für gesunde und zweckmässige Ernährung—*Berlin: Amtlicher Katalog, Verlag Gersbach & Sohn,* 1928. 300 pp. (4 plans.)

This official catalog of the Nutrition Exhibition held at Berlin, May 5 to August 12, 1928, is of interest to workers in hygiene and public health, since it gives a succinct summary of the aims and purposes of each of the several sections of the exhibition and enumerates the displays and exhibits designed to present each subject. It will be useful alike as a plan for public exhibits and as a résumé of current German scientific accomplishment in the field of nutrition. It deals not only with foods and their preparation, protection, and conservation, but also with water supplies and milk.

C. A. KOFOID

Play Day. The Spirit of Sport—*By Ethel Perrin and Grace Turner. New York: American Child Health Association,* 1929. 77 pp. Price, $.35.

Why play days; how play days develop the spirit of sport; the programs of major and minor sports carried out by several city high schools, universities, state teachers colleges, rural schools, and industrial units—all make up the contents of this helpful pamphlet. It is a unique contribution to the director of athletics of an institution or the promoter of civic recreation. The pamphlet is attractive in design, make-up and typography, the text brightened by several excellent photographic illustrations. It is published in coöperation with the Women's Division, National Amateur Athletic Federation.

A. B. TOWSE

Die Malaria in ihrer Bedeutung für die Geschichte Roms und der römischen Campagna—*Eine kulturhistorische Studie von Angelo Celli, Herausgegeben von Anna Celli-Fraentzel, mit einem Geleitwort von Prof. Dr. Henry E. Sigerist. Leipzig: Georg Thieme,* 1929. vi + 118 pp., 1 map. Price, 12 marks.

The author is a celebrated Italian investigator of the malarial parasites of man and a prominent worker in the field of malaria control. His practical work in these problems in the Roman Campagna has peculiarly fitted him to consider the historical aspects of the relations of malaria to the past history of this fever stricken region, so often depopulated and repopulated within historic times. Accordingly he has made an intimate study of available sources, and concludes that from the very beginning of historical records political causes, whether at the hands of Emperors, Goths, or Popes, are not to be charged with the devastations of human life and culture in this area immediately surrounding and tributary to the Eternal City, but rather malaria.

There is historical evidence of a cyclic aspect of recurrent epidemics in which the severity of the disease was marked. There is, however, little evidence of immunity in those who have suffered from attacks of malaria in any of its forms. Much progress has been made in recent years in systematic drainage of the swamps of the Campagna. Quinine in both tablet and liquid form for injection is supplied free by the State, and a staff of 43 physicians is in charge of the campaign. Extensive screening of houses is used as a protection against mosquitoes. Experiments in mosquito control are in progress.

The historical account is supplemented by an extended appendix citing literature covering the prehistoric, classical, medieval and modern periods. This is of great epidemiological value, since the references in historical, political, sociological, as well as medical literature, have been sought out and interpreted by a competent epidemiologist. The treatise is a critical contribution of permanent value to the historical aspect of the epidemiology of this important disease. CHARLES A. KOFOID

The Elements of the Science of Nutrition—*By Graham Lusk, Ph.D., Sc.D. (4th ed. rev.) Philadelphia: Saunders,* 1928. 844 pp. Price, $7.00.

The fourth edition of this book will be welcomed by all students of the science of nutrition as well as by the medical profession. The author has long maintained the premier position in studies on nutrition, and since its first appearance, his work has been a standard reference.

The preface contains one statement which can be commended to all authors, should be printed on a card, and placed on the desk of every would-be author: "Throughout, no statement has been made without endeavoring to examine the evidence on which it is based." Without doubt, this conscientious view has been responsible for the high position Professor Lusk and his writings have always occupied. This latest edition, which has been entirely reset, will, like its predecessors, remain the standard book of reference.

The make-up and printing are excellent. M. P. RAVENEL

Nursing Care of Communicable Diseases—*By Mary Elizabeth Pillsbury. Philadelphia: Lippincott,* 1929. 463 pp. Price, $3.00.

This is a very valuable book, by means of which the hospital and public health nurse may become well acquainted with prophylactic technic. It also contains a concise and well arranged reference to the more recently accepted administrative procedures for

the control of communicable diseases. Frequent reference is made to the Report of the Committee on Standard Regulations for the Control of Communicable Diseases of the American Public Health Association.* It also shows the author's acquaintance with the surveys of health work in large cities made under the direction of the Committee on Administrative Practice.

It is quite natural that when one prepares a book of this character greater emphasis should be placed upon the technic employed in those institutions with which the author has been associated. She therefore lays particular emphasis on certain practices of communicable disease control, within and without the hospital, in Connecticut, especially New Haven, and in Providence and New York City. As the surveys in these cities are admirable examples on which to base and recommend practice, the book makes a very valuable guide for nurses.

A sketchy outline is first given of the causes of disease and the known means for control. Individual immunity and resistance to disease are discussed, as also means of public control. In two well written chapters, the prophylactic technic of nursing is outlined. There follows a chapter on each one of the diseases which are now generally recognized as being reportable.

The book is well illustrated and a great deal of valuable material has been crowded into its 463 pages.

HENRY F. VAUGHAN

* *A. J. P. H.*, Mar., 1927. Reprints obtainable from A. P. H. A. 25 cents.

Living with the Law—*By June Purcell Guild. New York: New Republic,* 1928. 266 pp. Price, $1.00.

This, the 24th in the paper bound, blandly uncut pages, New Republic Dollar Series, is a popular contribution by an obviously "social minded" author to the enlightenment of the laity on the confused and conflicting tenets which comprise what is known as "The Law." Since ignorance of the subject is legally inexcusable, this description and discussion of the law as it applies to persons and social problems ought to be of some value to the befuddled lay (non-legal) body of our citizens. It may even instruct the sanitarian, though neither he nor anyone else will get much out of the chapter on public health, which is the leanest and least satisfactory in the book. On the other hand, the chapters on mental hygiene seem excellent, and those on marriage and divorce, husbands and wives, and parents and children are likewise valuable. Those on aliens and immigration are distinctly less so, but there is a good finish on criminal law and trials. The book is well printed, dispenses with an unnecessary index, and has an inadequate bibliography. It is worth a dollar to those who have to live with the law. JAMES A. TOBEY

Mother and Child. Advice to the Young Wife and Mother of Today—*By Mary Lyon (Mrs. Massey Lyon). Macmillan,* 1928. 215 pp. Price, $2.00.

This is an ambitious attempt to guide the young mother along a very extensive highway beset with many possibilities. The language and materials suggested are naturally those of England, and similar books for American mothers which appear to me to be more useful in this country are available. In connection with diphtheria, immunization by means of toxin-antitoxin is not even mentioned, though the therapeutic use of antitoxin is recommended. Such small books touching on so many subjects may tend to frighten, instead of inform, young mothers, but perhaps they serve to stimulate a demand for periodic examination and instruction by the physician. If so, they may serve a useful purpose. The print is small, but the subjects are well marked. LEROY A. WILKES.

Community Hygiene—*By Dean Franklin Smiley, A.B., M.D., and Adrian Gordon Gould, Ph.B., M.D. New York: Macmillan,* 1929. 350 pp. Price, $2.00.

This book is presented as a companion volume to "College Textbook of Hygiene" by the same authors. As the title implies, it considers those facts which concern the promotion and protection of public health.

Beginning with a short history of public health work, four sections follow, covering the subjects usually included in a book of this type.

The material is sound, well stated, and sufficiently inclusive. With a few exceptions, the illustrations are only fair. The printing and make-up of the book are good. M. P. RAVENEL

Laws of Pennsylvania Relating to Social Work—*Compiled by John S. Bradway. Philadelphia: Public Charities Association of Pennsylvania,* 1929. 253 pp. + Index. Price, $2.50.

A valuable compilation of the Pennsylvania laws on all phases of social work, with a good chapter on public health and safety. It is indispensable to health authorities and health workers in Pennsylvania, and of interest to sanitarians in other states as an example of a useful and practical compilation of laws on important social subjects.

JAMES A. TOBEY

The Diagnostics and Treatment of Tropical Diseases. A Compendium of Tropical and Other Exotic Diseases—*By E. R. Stitt, M.D., Sc.D., LL.D. (5th ed. rev.) Philadelphia: Blakiston,* 1929. 918 pp. Price, $9.00.

It is noteworthy that two outstanding books on the subject of tropical diseases should have appeared in the early months of 1929. No living man can write more authoritatively on the subject than Rear Admiral Stitt, who, besides being a master of the literature, has had a wide personal experience of which he has made good use.

The present volume contains six new chapters and much new material on topics found in older editions. The author has called to his aid several medical officers of the Navy, who have contributed to a number of subjects.

Approximately one-fourth of the book is given to an appendix, in which matters of great importance are treated. Here one finds an Index of Clinical Diagnosis, designed to suggest quickly diagnostic possibilities. Of especial interest also is the section on Tropical Hygiene. It is well stated that while preventive medicine is of prime importance in temperate climates, it is undoubtedly the first consideration in the tropics.

The book has been brought up to date. The author is well known for his ability to write clearly and to give those facts which the reader needs to know.

The illustrations are good. The general make-up of the book is excellent, though we wish lighter paper had been used. It is easily the best book on the subject which America has produced, and one of the best in any language.

M. P. RAVENEL

Practical Clinical Laboratory Diagnosis—*By Charles C. Bass, M.D., and Foster M. Johns, M.D. (3d ed. rev.) Baltimore: Williams & Wilkins,* 1929. 187 pp. Price, $7.50.

This is practically a new book, entirely rewritten, reillustrated, and brought up to date. It even has a new publisher.

The former editions were favorably received, and were extensively used; so the authors have had the advantage of criticisms and suggestions, which they have made use of in the present volume. They have not burdened the pages with discussions, but have adhered to the

original idea of giving those procedures which have been found the best and simplest. While some may criticise this, it is, in the reviewer's opinion, the most useful plan for the average student as well as laboratory worker.

Except for the colored plates, which are good, the illustrations are not attractive, though they fulfil their purpose. Many of the microphotographs are poor, and might well have been omitted. The material is sound, and given in an understandable fashion. The book will doubtless continue to enjoy its well deserved reputation. M. P. RAVENEL

Handbook of Microscopical Technique. *For Workers in Both Animal and Plant Tissues—Edited by C. E. McClung, Ph.D. New York: Hoeber,* 1929. 495 pp. Price, $8.00.

One undertakes the reviewing of a book of this type, written, as it is, by a number of experts, with considerable trepidation. Since no one is apt to be an expert along all the lines considered, the present reviewer has taken the precaution of getting the opinions of a number of specialists on their particular subjects.

Needless to say, the book contains an abundance of useful material, most of which is well and correctly put. The two outstanding faults are that routine and standard procedures common in most diagnostic and teaching laboratories are neglected for the introduction of those which are unusual and special. The second fault is common to many books of this type, namely, considerable duplication and lack of organization.

The subtitle would limit the book to tissue work; yet considerable space is given to the staining of acid fast organisms, flagella, spores and capsules. In spite of this, one looks in vain for Levaditi's stain for spirochetes or for any method of staining Negri bodies. Neither is even mentioned in the index. A number of other omissions of commonly used and useful methods are noted. Terry's method for rapid diagnosis of tumors is not mentioned, nor is Naylor's technic for staining plant tissues. In a number of places the directions given are incomplete and unscientific. We are told that "higher or lower temperatures" may be necessary for fixing, but the range is not stated, and no mention is made of the rapid method by boiling in 10 per cent formalin. Again we are advised to use pieces of tissue "not larger than a small pea." Why not give more exact measurements according to the metric system? No mention is made of the use of methyl alcohol as a fixative, especially for blood films or smears from exudates. Under the head "Acid Alcohol," page 475, "a 1 per cent solution" is recommended for decolorizing; yet we look in vain to find out what is meant by acid alcohol, and whether the 1 per cent refers to the acid, the alcohol, or to the mixture. Referring to either of the two other pages (321 and 422) on which acid alcohols are mentioned, one finds a number of formulas containing various acids recommended chiefly for fixing tissues. There is no indication of the one referred to as useful for decolorization in a 1 per cent solution.

Some of the procedures recommended are not up to date. For example, in discussing Wright's blood stain, page 245, the method in common use upon the recommendation of Wright himself is not mentioned. Many similar mistakes and omissions could be pointed out, but these will suffice to give a general idea of the shortcomings of the book.

The make-up and printing are in general good, though the paper is heavy and the surface too much glazed. A number of misprints, even of proper names, are noted—occasionally on the same page a proper name will be spelled in two ways. The outstanding feature of the book is Chapter 10, on Stains and Staining. M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

New York State—One of the most complete reports of marriage statistics has recently been published by the New York State Department of Health for the years 1921 to 1924. This report also contains an introductory analysis for the years 1916 to 1924. A detailed table of contents facilitates reference to special summary and rate tables.

In 1927 the Domestic Relations Law was amended, providing for the direct monthly forwarding of the original marriage documents by town or city clerks to the state department and of copies of these documents to the county clerks. This change, according to the Director of Vital Statistics, has brought about a marked improvement in the timeliness and completeness of marriage returns and will make possible the publication of statistics of marriages simultaneously with those of births and deaths.

Los Angeles County, Calif.—The health department report for the year ending June 30, 1928, comprising 385 pages, forms a part of the annual report of all county bureaus. The most notable advances were the completion of the organization plan of new health centers, and the reduction of communicable diseases. During the past 13 years, the infant mortality rate in rural territory has been reduced almost one-third. "In spite of the general ignorance of the Mexicans, our work has reduced their infant mortality from 1 in 3 in 1915, to 1 in 11 in 1927." During the year, nearly 16,000 children between the ages of 1 and 9 years were immunized against diphtheria.

The Pomona health center was open to the public in December. This building, costing approximately $64,000, houses, as do all the major health centers, the division of Outdoor Relief, a small hospital of 6 beds, a number of treatment clinics operated mainly by volunteer assistants of the local medical men, besides the rooms of the local branch of the county health department. The Santa Monica health center, costing approximately $83,000 (including land) was opened in 1928. During the year a large center was planned for Belvedere Gardens, an area occupied by some 120,000 people. This center, containing 22,150 sq. ft. of floor space, is nearing completion at a cost of $83,000, plus $13,000 for the land.

The total population served by the department was 657,555. The expenditures by the county for functions strictly chargeable to public health amounted to 92 cents per capita. Including expenditures by the county recorder for vital statistics, and by school boards for nursing and certain dental activities, the amount was $1.05 per capita.

Child Labor in Mississippi—A report, just from the press, of a study, *Child Labor in Mississippi*, made by the National Child Labor Committee in the fall and winter of 1927–28, reveals no evidence of any deliberate abuse of children. The foreword to the report states:

> It is the same old story; an unconsidering public accepts with but little question low legal standards, and with even less question lack of enforcement. Poor laws are nullified by common consent and there is no fully informed public to decree and enforce by the law of custom what the state and local authorities fail to decree and enforce.

Only those children of 12–16 years of age, who were working regularly and received pay for their work, were included in the study. In the towns selected, the names of all children between 12 and 16

years appearing on the school census were checked against the school attendance records. Those not in school were interviewed at their homes and a record of their work or idleness was made. The children working part time were interviewed at school.

Mississippi, along with 3 other states only, has a 44 hour week for working children. The 8 hour day, and night work provision of the law measure up to the standards generally adopted in other states; but these provisions, fine as they are, are applicable only to children working in mills, canneries, workshops, factories, and manufacturing establishments.

The study of these child laborers, 1,891 in number, shows that 56 per cent were white; 44 per cent, Negroes; 65 per cent, part-time workers, and 34.7 per cent, full-time workers; 33.3 per cent, workers whose jobs were covered by law, and 66.6 per cent, workers whose jobs were not covered by law.

A study of the ages of these working children reveals that 33.3 per cent were 13 years of age or less; 35.7 per cent, 14 and 15 years; and 31 per cent, 16 years or more.

Three-fourths of all the full-time children were working more than 8 hours per day, the average day for all children being 9.6 hours. For 83.1 per cent of the children 13 years or less, 74.7 per cent of those 14 and 15 years, and 71.2 per cent of those 16 years and over, a work day of more than 8 hours was the lot. Of the part-time children 47.1 per cent worked more than 8 hours on Saturday.

Of all the full-time children only 11.5 per cent worked 44 hours or less per week. In considering the age with respect to hours of work per week, it was found that 88.1 per cent of those 13 years or less, 84.5 per cent of those 14 and 15 years, and 96.4 per cent of those 16 years or more, worked more than the legal week of 44 hours. As to part-time children, when the working hours are added to the hours in school, it is shown that more than two-fifths (43.5 per cent) worked more than 44 hours per week.

From the standpoint of the full-time children, night work was of comparatively little importance; but for part-time children, it was of great importance. Nearly two-fifths of the latter were found to be working at night.

Briefly, it may be stated that: (1) Many children are engaged in occupations not covered by the child labor law, for whom there is no restriction as to either age or conditions of work. (2) Many children are engaged in occupations covered by the child labor law at an age which is entirely prohibited. (3) Many of the children who have reached the legal age for such employment are employed in violation of the provisions regarding hours and night work.

Racine, Wis.—The 1928 honor roll of health reports includes Racine, where the health officer in 58 mimeographed pages, bound in attractive light blue covers, has prepared a document worthy of study. This city of 75,000 people has a health department budget in 1929 of $43,870 as compared with $39,895 for the previous year. A birth rate of 19.3, a death rate of 8.9, and an infant mortality rate of 48.7 are recorded. Budget data for 6 years and death rates by principal causes for 5 years are tabulated for comparative purposes.

A feature of the report is a reproduction of attractive posters used by the department in factories and stores. The last 25 pages of the report are devoted to *Appraisal* results on the 1928 schedule of the Committee on Administrative Practice. These results are compared graphically with preceding appraisals. It is noteworthy that the cost of 125 copies of this report was only $69.11, exclusive of the time of the staff.

Reference is made to four educational leaflets published during the year. One of these, "This is no April Fool," was printed in green to correspond in size and shape to the gas and electric bills and was distributed to every house with these bills by courtesy of the Wisconsin Gas and Electric Company. Its title was suggested by the fact that distribution was begun on April first. It set forth the importance of smallpox vaccination and announced the annual campaign of vaccination clinics beginning April 1. During the year, the health officer gave 27 ten minute radio talks on health.

Nursing services, according to a table showing time distribution by services, 1924–28, have increased in all phases except those relating to the supervision of acute communicable diseases. The largest increase in nursing service is in the interest of infants under one year of age. Every nurse delivers to babies in her district a certificate of birth registration incorporated in a baby health booklet, and on the baby's first birthday, delivers a greeting letter including health advice.

Montana—The provision of facilities to investigate spotted fever is outlined in the 1927–28 biennial report. The U. S. Public Health Service has given financial aid to Cascade, Lewis, Clark, and Big Horn Counties to maintain full-time health departments, and has for a number of years been doing investigation work on spotted fever. The last session of the legislature appropriated $60,000 to construct a laboratory in the Bitter Root Valley in order to supply proper quarters for carrying on the work of the U. S. Public Health Service and the State Board of Entomology. This Service has developed a vaccine for the prevention of Rocky Mountain spotted fever, which is furnished free to the doctors of the state on application.

State law places milk control in the hands of the Livestock Sanitary Board. The American Child Health Association, on the request of that board and the State Board of Health, made a milk survey in various towns of the state. It is reported that 2 milk-borne epidemics occurred during the biennium, 1 of scarlet fever and 1 of typhoid, due to carriers handling the milk in dairies.

The only absolute prevention of such epidemics is proper pasteurization of milk. We do not believe it feasible at the present time to enact and enforce a state law for universal pasteurization, but we do urge cities to pass ordinances requiring the pasteurizing of milk sold in towns where proper inspection of pasteurizing plants can be arranged for.

Maryland—The 1928 report of the Bureau of Sanitary Engineering of the Department of Health opens with the gratifying statement that by far the lowest typhoid fever incidence in the history of the state is recorded for last year. The rate for the state was 5.2 per 100,000, that for Baltimore being 4.2. Ten years ago the rate for the state was 16.9.

The Hagerstown 10 m.g.d. water filtration plant and accessories on the Potomac River were put in service at an approximate cost of $1,250,000. Progress is noted in the development of other water supply and sewage disposal systems. On account of the rapidly increasing popularity of outdoor life, it has become necessary each year to make a complete study of the camps throughout the state with respect to their water supply and sewerage facilities. The activities of one man were devoted to Anne Arundel County, in which the greatest number of camps are located. The value of this work in reducing sporadic typhoid fever has already been apparent. It is interesting to note that one engineer is engaged in field studies of all milk pasteurization plants outside of Baltimore. During the year there were 1,996 field inspections, 205 permits issued, 5,298 samples collected, and over 80,000 miles of travel.

BOOKS RECEIVED

HYGIENE AND PUBLIC HEALTH. (8th ed.) Parkes and Kenwood. Philadelphia: Blakiston, 1929. 823 pp. Price, $7.00.

WHO'S WHO AMONG THE MICROBES. By William H. Park and Anna W. Williams. New York: Century, 1929. 302 pp. Price, $3.00.

A MANUAL OF HELMINTHOLOGY: MEDICAL AND VETERINARY. By H. A. Baylis. New York: Wood, 1929. 303 pp. Price, $10.00.

PROTOZOOLOGY. By John Gordon Thomson and Andrew Robertson. New York: Wood, 1929. 376 pp. Price, $11.00.

THE STRUGGLE FOR HEALTH. By Richard H. Hoffmann. New York: Liveright, 1929. 341 pp. Price, $3.50.

AGELESS YOUTH. By Charlotte C. West. New York: Crowell, 1929. 466 pp. Price, $3.00.

YOUR EYES AND THEIR CARE. By Edgar S. Thomson. New York: Appleton, 1929. 175 pp. Price, $1.50.

FOODS OF THE FOREIGN-BORN. By Bertha M. Wood. Boston: Barrows, 1929. 110 pp. Price, $1.25.

STUDIES IN NUTRITION—INFLUENCE OF SALTPETER. Vol. II. By Ward J. MacNeal. Urbana: University of Illinois Press, 1929. 406 pp. Price, $5.00.

YOU AND THE DOCTOR. By John B. Hawes, 2d. New York: Houghton Mifflin, 1929. 181 pp. Price, $2.00.

ANIMAL PARASITOLOGY. By Robert Hegner, Francis M. Root and Donald L. Augustine. New York: Century, 1929. 731 pp. Price, $6.50.

BACTERIOLOGY OF THE HOME. By Ava L. Johnson. Peoria: Manual Arts Press, 1929. 167 pp. Price, $2.25.

GOOD HEALTH. By Ian S. Thomson. New York: Longmans, 1929. 122 pp. Price, $1.40.

GUIDE FOR A HEALTH PROGRAM. Grades One, Two and Three. By Jessie I. Lummis and Willicdell Schawe. Yonkers: World Book Co., 1929. 196 pp. Price, $1.24.

ADVENTURES IN HEALTH. By Nathalie Forbes Moulton. Boston: Little, Brown, 1928. 140 pp. Price, $.70.

EVERYDAY DOINGS IN HEALTHVILLE. A Health Reader. By Emma Serl. New York: Silver, Burdett, 1929. 128 pp. Price, $.68.

PLAY DAYS FOR GIRLS AND WOMEN. By Margaret M. Duncan. New York: Barnes, 1929. 87 pp. Price, $1.60.

RECREATIVE ATHLETICS. (rev. and enl.) Prepared by the Playground and Recreation Association of America. New York: Barnes, 1929. 200 pp. Price, $1.00.

AN EXHIBITION HANDBOOK. Special Demonstrations Illustrating Features of the Work in Physical Education in the Newark Public Schools. Assembled by Randall D. Warden (rev. ed.) New York: Barnes, 1929. 107 pp. Price, $1.00.

AN HOUR ON HEALTH. By Morris Fishbein. Philadelphia: Lippincott, 1929. 158 pp. Price, $1.00.

THE SOCIAL WORKER IN FAMILY, MEDICAL AND PSYCHIATRIC SOCIAL WORK. By Louise C. Odencrantz. New York: Harper, 1929. 374 pp. Price, $2.50.

TEACHING HEALTH IN FARGO. By Maud A. Brown. New York: Commonwealth Fund Division of Publications, 1929. 142 pp. Price, $1.50.

PHYSICIAN AND PATIENT. Personal Care. Edited by L. Eugene Emerson. Cambridge: Harvard University Press, 1929. 244 pp. Price $2.50.

T[illegible]HOLOGY OF THE UNCONSCIOUS. By C. [illegible]entine. New York: Macmillan, 1929. 162 pp. Price, $1.60.

HEALTH [illegible]CE AND HEALTH EDUCATION. For College Students and Teachers in Training. By W. Alfred Buice. New York: Wiley, 1929. 345 pp. Price, $3.00.

PROGRESSIVE RELAXATION. By Edmund Jacobson, M.D. Chicago: University of Chicago Press, 1929. 429 pp. Price, $5.00.

EDUCATIONAL ACHIEVEMENT OF PROBLEM CHILDREN. By Richard H. Paynter and Phyllis Blanchard. New York: Commonwealth Fund Division of Publications, 1929. 72 pp. Price, $1.00.

ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY. Vol. IV. Part II. London: The "Pickett-Thomson" Research Laboratory, 1929. 494 pp. Price, $10.00 per volume.

1929 MUNICIPAL INDEX AND ATLAS. (6th annual ed.) New York: American City Magazine Corp. 787 pp. Price, $5.00.

THE HUMAN MECHANISM. (2d rev. ed.) By Theodore Hough, William T. Sedgwick, and J. A. Waddell. New York: Ginn, 1929. 691 pp. Price, $3.00.

DISEASES OF THE THYROID GLAND. (2d ed.) By Arthur E. Hertzler. St. Louis: Mosby, 1929. 286 pp. Price, $7.50.

DON'T BE AFRAID. By Joseph Lobel, M.D. New York: Putnam, 1929. 233 pp. Price $2.00.

A LOST COMMANDER: FLORENCE NIGHTINGALE. By Mary Raymond Shipman Andrews. Garden City: Doubleday, Doran, 1929. 299 pp. Price, $3.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Tuberculosis Transmission—A bacteriologic study of the dust in patient's rooms may indicate the degree of danger to contacts of the patient. This would seem a rather belabored demonstration of an obvious and not eminently practical measure.

AUGUSTINE, A. E. The Transfer of Tuberculosis by Dust and Other Agents. J. Prev. Med., 3, 2: 121 (Mar.), 1929.

Poliomyelitis Incubation Period—Observations which lead the authors to conclude that the apparent period falls within 6 and 20 days. Experimental infection in monkeys gave an incubation period varying from 4 to 8 days.

AYCOCK, W. L., and LUTHER, E. H. The Incubation Period of Poliomyelitis. J. Prev. Med., 3, 2: 103 (Mar.), 1929.

Health Nursing Education—A survey of educational opportunities in public health nursing leads the author of the paper (which is a chapter from her forthcoming book) to conclude that the outlook in nursing education is promising.

BEARD, M. Education of the Public Health Nurse. Am. J. Nurs., 24, 4: 449 (Apr.), 1929.

Children's Diseases—A detailed statistical analysis of incidence and death rates of the common communicable diseases of children. The maximum incidence among children who have not had a previous attack is six years; the incidence declines thereafter either because of the development of immunity or a less frequent contact. The maximum fatality occurs under one year.

COLLINS, S. D. Age Incidence of the Common Communicable Diseases of Children. Pub. Health Rep., 44, 14: 763 (Apr. 5), 1926.

Typhoid Fever Incidence—A statistical study of typhoid fever in Massachusetts reveals, among other interesting findings, that morbidity and mortality rates increase from towns under 2,500 to towns of 100,000. This suggests that typhoid fever is not a distinctly rural problem, but one of personal contact.

BIGELOW, G. H., and DOERING, C. R. Typhoid Fever in Massachusetts. Am. J. Hyg., 9, 2: 445 (Mar.), 1929.

Herd Immunity—A philosophical discussion of herd immunity to disease, and other phases of public hygiene, which should be made freely available to all health officials, a condition not fulfilled by the present inclusion only in a British health journal.

DUDLEY, S. F. Herds and Individuals. Pub. Health, 42, 7: 219 (Apr.), 1929.

Another Rheumatism Paper—As I have forsworn British papers on rheumatism, I can only report that the author says the paper is about external and internal causes which "contribute to the development of rheumatic disease."

FOX, R. F. Rheumatism in Relation to Industry. J. State Med., 37, 4: 196 (Apr.), 1929.

Poliomyelitis in Great Britain—An epidemiologic and clinical study of a Glasgow outbreak, with the usual findings.

HALLIDAY, J. L. The Glasgow Outbreak of Poliomyelitis in 1928. Med. Off., 41, 15: 155 (Apr. 13), 1929.

Indian Health Work—An outline of modern health conditions among the Indians, the factors which influence

them, and the hygienic measures undertaken; capable men and women are urged to join the service.

GUTHRIE, M. C. The Health of the American Indian. Pub. Health Rep., 44, 16: 945 (Apr. 19), 1929.

Epidemiologic Trends—This paper tells of the danger inherent in extrapolating by prolonging a trend line. Statisticians and epidemiologists wishing to ascertain trends would do well to read more of this paper than the reviewer was willing to do.

HARMON, C. E. A Study of the Problem of Obtaining a Trend Line for Epidemiological Data. J. Prev. Med., 3, 2: 139 (Mar.), 1929.

Epidemic Septic Sore Throat—A detailed epidemiologic report of the milk-borne epidemic of septic sore throat occurring at Lee, Mass., in which 975 cases, with 48 deaths, occurred.

LOMBARD, H. L. Septic Sore Throat in Massachusetts: Epidemiology. J. Prev. Med., 3, 2: 81 (Mar.), 1929.

Pasteurization in Great Britain—What a Scottish veterinarian thinks about pasteurization. One of those "It's all right, but —" articles. An interesting paper for the person who believes in many grades of milk.

MCALLAN, J. The Grading of Milk. J. State Med., 37, 4: 229 (Apr.), 1929.

Irradiation and Colds—A group of cold-susceptible students irradiated for 10 to 16 minutes at weekly intervals had 40 per cent less cold than the controls. This experience controverts a recently published opinion that irradiation had no effect upon colds.

MAUGHAN, G. H., and SMILEY, D. F. Am. J. Hyg., 9, 2: 466 (Mar.), 1929.

Pediatric Progress—Another excellent summary of the advances in pediatric practice during the year. Should prove a useful review for child hygiene workers.

MORSE, J. L. Progress in Pediatrics. New England J. Med., 200, 15: 771 (Apr. 11), 1929.

Nursery Schools—An account of a nursery school conducted on the grounds of a grade school in Chicago. Most interesting.

MURPHY, M. E., and MOHR, E. A Public School Nursery School. Child Health Bull., 5, 2: 38 (Mar. 1), 1929.

Southern Goiter Survey—A statewide survey of endemic goiter in Tennessee indicates that goiter is found more frequently than was supposed to be the case in southern states. Simple goiter is much more common among colored than white children.

OLSEN, R. Endemic Goiter in Tennessee. Pub. Health Rep., 44, 15: 865 (Apr. 12), 1929.

Lead Poisoning—A general review of the administrative measures taken to reduce plumbism, and a consideration of some of the cases still encountered.

OLIVER, THOMAS. Lead Poisoning in Industries. J. State Med., 37, 4: 187 (Apr.), 1929.

Camp Nursing Problems—How the camp nurse is kept busy in the private camp and in the camp operated by a welfare organization is interestingly told. Her opportunities for health education are many and various.

WILLS, G. A., and WEISS, M. M. A. Nursing in Summer Camps. Am. J. Nurs., 24, 4: 388 (Apr.), 1929.

More Septic Sore Throat—A series of papers reviewing the history of milk-borne outbreaks of septic sore throat (White); a clinical study of the cases occurring in the Lee, Mass., epidemic (Holmes); and an invaluable account of the Lee outbreak which summarizes the lessons taught (Bigelow).

WHITE, BENJAMIN, *et al.* Epidemic Septic Sore Throat. New England J. Med., 200, 16: 797 (Apr. 18), 1929.

NEWS FROM THE FIELD

SOCIAL SCIENCE RESEARCH COUNCIL

THE Social Science Research Council has elected the following members under the recently created classification of Members-at-Large: Professor Henry M. Bates, Dean of the Law School, University of Michigan; Dr. Adolph Meyer, Professor of Psychiatry, Director, Henry Phipps Psychiatric Clinic, Johns Hopkins University; Dr. C.-E. A. Winslow, Graduate School Chairman, Professor of Public Health, Yale University; and Professor Robert S. Woodworth, Department of Psychology, Columbia University.

HOSPITAL LIBRARY AND SERVICE BUREAU

ON the approval of the Board of Trustees and Delegates, the American Conference on Hospital Service has made an agreement with the American Hospital Association to maintain and administer the Hospital Library and Service Bureau on and after June 30, 1929.

To give the American Hospital Association full freedom in the administration of the bureau, Donelda R. Hamlin, Director of the Hospital Library and Service Bureau, has sent in her resignation to take effect June 25, 1929.

NEW VENEREAL DISEASE COMMITTEES

TWO new committees are to be formed to replace the Venereal Disease Section of the Associated Out-Patient Clinics Committee of the New York Tuberculosis and Health Association: one on clinics treating gonorrhea, and the other on those treating syphilis.

Dr. Thomas J. Kirwin is chairman of the first and Dr. Dudley D. Stetson chairman of the second.

The committee on syphilis held its

Members of the Los Angeles County Health Department and friends at the opening of the East Side Health Center, Belvedere Gardens—a suburban area near Los Angeles, Calif. The center contains 22,150 sq. ft. of floor space and cost $96,000. It houses the County Health Department, the district emergency hospital, clinics for the indigent sick, and the County Local Welfare Division. An estimated population of 175,000 will be taken care of here. This is the fifth of the new Health and Welfare units to serve the needs of the outlying districts of Los Angeles County.

first meeting on May 3, and plans were laid for an inclusive program and a study of all the clinics in the city caring for venereal diseases. This committee has as its aim the formulation of standards of clinic service and their promotion; promotion of economy and efficiency in the management of clinics; and, in conjunction with the Welfare Council, the coördination of their work, and with allied medical, health and social welfare agencies.

SOCIAL HYGIENE INSTITUTE

THE fourth annual Institute of the American Social Hygiene Association will be held in coöperation with the New York University, the Chautauqua Institution and the Chautauqua Summer Schools at Chautauqua, N. Y. Dr. Thomas W. Galloway will give two courses in social hygiene and Dr. Edith Hale Swift will give a series of lecture-discussions on parenthood and the character training of children. Descriptive leaflets can be obtained from the American Social Hygiene Association, 370 Seventh Ave., New York, N. Y.

DELTA OMEGA LECTURE

THE second annual lecture under the auspices of Delta Omega, the honorary public health society, was delivered at the Massachusetts Institute of Technology on April 12, 1929, by George T. Palmer, Dr.P.H. Dr. Palmer spoke on the school health program of the American Child Health Association, of which he is the Director of Research. Members of the Gamma Chapter at M. I. T. and of the Beta Chapter at the Harvard School of Public Health, as well as many others interested, were present.

Following the lecture, a dinner of the Delta Omega Society was held, with Dr. Palmer and Dr. James A. Tobey, of New York, national secretary of the society, as the principal speakers. Professor S. C. Prescott presided.

WHAT EVERY WOMAN SHOULD DO ABOUT CANCER

THE above is the title of a new publication issued by the American Society for the Control of Cancer. This small pamphlet describes in a brief, succinct manner the main types of cancer and their danger signals, advising medical attention if the latter are apparent. It concludes with a list of practical suggestions regarding ways in which women can help toward the control of cancer, both in their own homes and in society, in general.

DR. KARL IMHOFF VISITS UNITED STATES

DR. Karl Imhoff, the inventor of the famous Imhoff tank, and Mrs. Imhoff arrived in New York the latter part of April on a visit to this country. Their itinerary extended from New York to San Francisco, taking in North Carolina, Georgia, Louisiana and Texas along the southern route, and returning via Chicago, Ill.

PERSONALS

DR. ALLEN HUTCHESON has been appointed City Health Officer of Houston, Tex., succeeding Dr. A. H. Flickwir.

DR. DOUGLAS L. CANNON was unanimously elected by the State Medical Association, April 19, to the State Board of Health to succeed the late Dr. Samuel W. Welch.

DR. ALBERT COMPTON BRODERS, pathologist to the Mayo Clinic, received the honorary degree of doctor of science at the commencement of the Medical College of Virginia, May 28.

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